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ABSTRACT

The general purpose of this research project was to discover those personality characteristics which differentiate college students who tend to learn more effectively from one instructional format than from another. Two college courses were studied concurrently and four different teaching conditions were utilized in each course. A comprehensive battery of personality inventories was administered to each of the students, and three types of criterion measures were collected in both courses. Chapter 1 presents the problem. Chapter 2 discusses the methodology of the project and details the procedures used in the two experimental courses. Chapter 3 focuses on the main effects: those due to treatment variables (i.e., the relationships between the instructional conditions and the course outcomes) and those arising from the personality variables (i.e., the relationships between scale scores and the criterion measures). Chapter 4 presents the major trait-by-treatment interactions based upon the a priori personality scales. Chapter 5 describes the construction of new empirical interaction scales and presents the results using this strategy of scale construction. Chapter 6 reviews and discusses the major findings, and Chapter 7 summarizes the report. (Author/AF)

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STUDENT PERSONALITY CHARACTERISTICS
AND
OPTIMAL COLLEGE LEARNING CONDITIONS

by

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University of Oregon and Oregon Research Institute

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Preface

The goal of this research project was to discover those personality characteristics of college students which predispose them towards learning more effectively from one--rather than some other--particular instructional format. The program is predicated upon an assumption that no single college instructional procedure will be best for all students, but rather that there is an interaction between the personality of the student and the optimal method of teaching him. The present project serves to expand our knowledge of this interactive process by examining the characteristics of students which influence their relative performance in different instructional methods. The findings from this project--if replicated in other college courses--could have important implications for basic knowledge of critical personality differences among college students, and for applied practices aimed at grouping students into more homogeneous classes, each of which might profitably be taught by some different instructional procedure.

Approximately 900 students in each of two college courses were taught by one of four different instructional formats, two of which lie near each of the poles on the general dimension of "degree of course structure." Most of these students completed an extensive battery of personality measures which yielded over 350 test scores for each individual. Three broad classes of criterion information were assessed from each student in each of the two courses: (a) knowledge of course content, as measured by two comprehensive examinations (one of which included both an essay and a multiple-choice portion), (b) the amount of course-related but non-graded reading each student carried out during the course, and (c) the degree of student satisfaction with the course. This Report is focused upon the relationships between the student personality characteristics and these criterion measures among those students in each of the differing instructional formats. These interactive relations were explored both through the analysis of existing (a priori) personality scales, and through the development of new empirical interaction scales.

Acknowledgments

The design of the present study evolved from the collaboration of the author with three former members of the Psychology Department at the University of Oregon: William A. Bricker, Leslie A. Davison, and Vello Sermat. While the author has assumed the responsibility for the execution of the study and analysis of the findings, the others gave a good deal of time and thought to its conception. Without their initial help, the study could not have been completed.

The contribution of Richard R. Jones, presently a Research Associate at the Oregon Research Institute, has been enormous: first as a Teaching Assistant in one of the two experimental courses, later as a Research Assistant, and finally as a Research Associate and colleague. During the 1966-1967 academic year, while the author was spending a sabbatical year in Europe, Dr. Jones served as Project Coordinator.

The project was fortunate in having available three exceptionally able and dedicated Research Assistants: Gale H. Roid, Steven G. Ashton, and Edwin S. Shiman. It was due to the patient efforts of these three talented individuals that the 3,000 item responses elicited from each of the nearly 900 subjects in this study--over 2 million bits of data in all--have been transformed into the findings presented in this Report. Preliminary data analyses were carried out using the facilities of the Computing Center at the University of Oregon; Terry L. Liittschwager, the former Operations Director of the Center, continuously provided the project with assistance, for which we are very grateful. The data analyses were completed at the Computing Center of Oregon Research Institute, and the Health Sciences Computing Facility, UCLA, sponsored by N.I.H. Grant FR-3. Molly Stafford, an unusually capable programmer at Oregon Research Institute, provided most of the computer programs.

The author also wishes to acknowledge, with great thanks, the encouragement and help of others who made this study possible: to Raymond Barnett, Charlotte Ruiz, and Andrey Skaife who, with Richard Jones, served as Teaching Assistants in the experimental courses; to Charles Crow, Mark Fish, Ronald Jones, Roberta Ray, Kenneth Stein, and Julian Taplan for their assistance as paper graders in the two courses; to Judith C. Gibbs, Andrea C. Lehmanowski, Ziona Bisno, Janice Vandiver Palmquist, and Sheila Quinn for their able and conscientious secretarial

services; and, finally, to three key administrators at the University of Oregon: William C. Jones, formerly Director of the Institute for College Teaching; Richard A. Littman, formerly Chairman of the Psychology Department; and Arthur W. Flemming, formerly President of the University.

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To the 892 University of Oregon students who elected to enroll in Psychology 204 in the Spring Quarter of 1965 and who thereby unwittingly became the "guinea pigs" for this project, this Report is affectionately dedicated. Hopefully, their good-natured forbearance in the face of these experimental procedures will enable their successors (perhaps their progeny) to enjoy a more rewarding University experience.

Table of Contents

Preface i

Acknowledgments ii

List of Tables v

Chapter I: The Problem 1

Chapter II: Procedures 14

Chapter III: Analyses of the Main Effects 28

Chapter IV: Analyses of the Interaction Hypothesis: The *A Priori* Scales 34

Chapter V: Analyses of the Interaction Hypothesis: The New Empirical Interaction Scales 69

Chapter VI: Stituations as Moderator Variables: A Discussion of the Findings 84

Chapter VII: Summary 108

References 122

Epilogue 131

Appendices

- Appendix A: Item number (and keying direction) of items included in the new interaction scales
- Appendix B: The Course Evaluation Questionnaire
- Appendix C: The Reported Behavior Inventory
- Appendix D: The Oregon Instructional Preference Inventory
- Appendix E: Predicted Peer Ratings (CPI Traits)

List of Tables

Table | Page

1 The experimental design 14a

2 The student characteristics assessed in this project 17a

3 The variables included in the Composite Personal Reaction Inventory, the Composite Choice Preference Inventory, and the Biographical Inventory 17b

4 Four criterion variables from the Course Evaluation Questionnaire 22a

5 Intercorrelations among the eight outcome variables in each of the two courses 22b

6 The factor structure of the eight outcome variables in each of the two courses 23a

7 The effects of the experimental teaching conditions upon the five major outcome variables: Analyses of variance and correlations 28a

8 The relationship between students' experience in a particular treatment and their later instructional preferences 29a

9 The relationships between six student attributes and the five major outcome variables 31a

10 A comparison of different data sources as predictors of course achievement 32a

11 Characteristics of the sample: Sex, class in college, course motivation, past academic performance (GPA), and scholastic aptitude 35a

12 The correlations between previous grade point average and the course satisfaction outcome variable in different teaching conditions 36a

13 Correlations of previous grade point average (GPA) and SAT verbal scores (SAT-V) with the non-graded reading outcome variable in different teaching conditions 37a

14 Correlations of SAT mathematical scores (SAT-M) with two course achievement outcome variables in different teaching conditions 37b

15 Correlations of previous grade point average and the essay test score in different teaching conditions 37c

Table		Page
16	The 49 a priori C.P.I. scales	38a
17	Correlations between C.P.I. scales and the course satisfaction outcome variable in different teaching conditions	39a
18	Correlations between C.P.I. scales and the non-graded reading outcome variable in different teaching conditions	40a
19	Correlations between C.P.I. scales and the course achievement factor score in different teaching conditions	40b
20	Correlations between C.P.I. scales and the essay test score in different teaching conditions	40c
21	Means, standard deviations, and intercorrelations among eight scales from the Survey of Study Habits and Attitudes (SSHA)	41a
22	Correlations of SSHA scales with the non-graded reading outcome variable in different teaching conditions	42a
23	Means, standard deviations, and intercorrelations among the sections of the Educational Set Scale (ESS)	43a
24	Correlations of the Educational Set Scale with the course achievement outcome variable in different teaching conditions	43b
25	Means and standard deviations of the S.V.I.B. scales	44a
26	Correlations between SVIB scales and the course satisfaction outcome variable in different teaching conditions	45a
27	Correlations between SVIB scales and the non-graded reading outcome variable in different teaching conditions	45b
28	Correlations between SVIB scales and the course achievement factor score in different teaching conditions	45c
29	Correlations between SVIB scales and the multiple-choice test score in different teaching conditions	46a
30	Correlations between SVIB scales and the essay test score in different teaching conditions	46b
31	Means and standard deviations of the scales from the EPPS	46c
32	Correlations between EPPS scales and the course satisfaction outcome variable in different teaching conditions	47a
33	Correlations between EPPS scales and the non-graded reading outcome variable in different teaching conditions	47b

Table		Page
34	Correlations between EPPS scales and the course achievement outcome variable in different teaching conditions	47c
35	Correlations between EPPS scales and the essay test score in different teaching conditions	47d
36	Means and standard deviations of the ACL scales, plus their correlations with number of adjectives checked and with the residual scores	48a
37	Correlations between ACL scales and the course satisfaction outcome variable in different teaching conditions	49a
38	Correlations between ACL scales and the essay test score in different teaching conditions	50a
39	Means and standard deviations of the WFPT scales, plus their correlations with total "like" responses and with the residual scores	50b
40	Correlations between WFPT scales and the course satisfaction outcome variable in different teaching conditions	51a
41	Correlations between WFPT scales and the multiple-choice test score in different teaching conditions	51b
42	Correlations between WFPT scales and the essay test score in different teaching conditions	51c
43	The 75 MMPI scales	52a
44	Correlations between MMPI scales and the course satisfaction outcome variable in different teaching conditions	53a
45	Correlations between MMPI scales and the course achievement outcome variable in different teaching conditions	53b
46	Correlations between MMPI scales and the non-graded reading outcome variable in different teaching conditions	53c
47	Correlations between MMPI scales and the essay test score in different teaching conditions	54a
48	Means, standard deviations, and intercorrelations among seven scales from the Composite Personal Reaction Inventory (CPRI)	55a
49	Correlations between Composite Personal Reaction Inventory (CPRI) scales and the course satisfaction outcome variable in different teaching conditions	55b

Table		Page
50	Correlations between Composite Personal Reaction Inventory (CPRI) scales and the non-graded reading outcome variable in different teaching conditions	55c
51	Correlations between Composite Personal Reaction Inventory (CPRI) scales and the course achievement outcome variable in different teaching conditions	55d
52	Means, standard deviations, and intercorrelations among twelve scales from the Composite Choice Preference Inventory (CCPI)	56a
53	Correlations between Composite Choice Preference Inventory (CCPI) scales and the non-graded reading outcome variable in different teaching conditions	56b
54	Correlations between Composite Choice Preference Inventory (CCPI) scales and the course achievement outcome variable in different teaching conditions	57a
55	Means, standard deviations, and intercorrelations among seven indices from Bass' Social Acquiescence Scale (BSAS)	57b
56	Correlations between Bass' Social Acquiescence Scale (BSAS) and the course satisfaction outcome variable in different teaching conditions	58a
57	Correlations between Bass' Social Acquiescence Scale (BSAS) and the essay test score in different teaching conditons	58b
58	Means and standard deviations of the Reported Behavior Inventory scales, plus their correlations with total RBI scores and with the residual scores	59a
59	Correlations between Reported Behavior Inventory (RBI) scales and the course satisfaction outcome variable in different teaching conditions	59b
60	Correlations between Reported Behavior Inventory (RBI) scales and the course achievement outcome variable in different teaching conditions	59c
61	Correlations between Reported Behavior Inventory (RBI) scales and the non-graded reading outcome variable in different teaching conditions	60a
62	Correlations between Reported Behavior Inventory (RBI) scales and the essay test score in different teaching conditions	60b
63	Means and standard deviations of the Predicted Peer Ratings, plus the correlations between normative and ipsative ratings	61a

Table		Page
64	Correlations between Predicted Peer Ratings and the course satisfaction outcome variable in different teaching conditions	62a
65	Correlations between Predicted Peer Ratings and the non-graded reading outcome variable in different teaching conditions	62b
66	Correlations between Predicted Peer Ratings and the course achievement outcome variable in different teaching conditions	62c
67	Correlations between Predicted Peer Ratings and the multiple-choice test score in different teaching conditions	63a
68	Correlations between Predicted Peer Ratings and the essay test score in different teaching conditions	63b
69	A comparison of the frequency of significant interaction effects for 49 CPI scales between (a) three actual (orthogonal) criteria and (b) three random normal deviates	64a
70	Significant interactions with the course satisfaction outcome variable: Summary table	65a
71	Significant interactions with the course achievement outcome variable: Summary table	66a
72	Significant interactions with the non-graded reading outcome variable: Summary table	66b
73	Significant interactions with the multiple-choice test score: Summary table	67a
74	Significant interactions with the essay test score: Summary table	67b
75	The validity of the new CPI interaction scales empirically constructed from the course satisfaction outcome variable	73a
76	The validity of the new CPI interaction scales empirically constructed from the course achievement outcome variable	74a
77	The validity of the new CPI interaction scales empirically constructed from the non-graded reading outcome variable	74b
78	The validity of the new CPI interaction scales empirically constructed from the multiple-choice test score	75a
79	The validity of the new CPI interaction scales empirically constructed from the essay test score	75b

Table		Page
80	The validity of the new OIPI interaction scales empirically constructed from the course satisfaction outcome variable	75c
81	The validity of the new OIPI interaction scales empirically constructed from the course achievement outcome variable	76a
82	The validity of the new OIPI interaction scales empirically constructed from the non-graded reading outcome variable	76b
83	The validity of the new OIPI interaction scales empirically constructed from the multiple-choice test score	76c
84	The validity of the new OIPI interaction scales empirically constructed from the essay test score	76d
85	The validity of the new RBI interaction scales empirically constructed from the course satisfaction outcome variable	77a
86	The validity of the new RBI interaction scales empirically constructed from the course achievement outcome variable	77b
87	The validity of the new RBI interaction scales empirically constructed from the non-graded reading outcome variable	77c
88	The validity of the new RBI interaction scales empirically constructed from the multiple-choice test score	78a
89	The validity of the new RBI interaction scales empirically constructed from the essay test score	78b
90	The validity of the new ACL interaction scales empirically constructed from the course satisfaction outcome variable	78c
91	The validity of the new ACL interaction scales empirically constructed from the course achievement outcome variable	78d
92	The validity of the new ACL interaction scales empirically constructed from the non-graded reading outcome variable	79a
93	The validity of the new EPPS interaction scales empirically constructed from the course satisfaction outcome variable	79b
94	The validity of the new EPPS interaction scales empirically constructed from the course achievement outcome variable	79c
95	The validity of the new EPPS interaction scales empirically constructed from the non-graded reading outcome variable	80a
96	The validity of the new ESS interaction scales empirically constructed from the course achievement outcome variable	80b

Table		Page
97	The validity of each of the new empirical interaction scales: Summary table	81a
98	The number of items in, KR-20 reliability of, and intercorrelations among the new interaction scales constructed from each of five inventories	82a
99	A comparison between the average predictive accuracy of general predictors vs. differential predictors	91a

Chapter I

THE PROBLEM

Over the years, in a continued effort to improve the practice of higher education, a number of investigators have attempted to assess the differential effects of various teaching procedures upon student achievement in college courses. The instructional methods which have been compared in studies of this sort can be divided into at least two major types: (a) variations in teaching techniques or "instructor input" and (b) variations in mode of performance or "student output."

Examples of research on the effects of different instructor inputs include comparisons between large vs. small (e.g., Goldberg, 1964), required vs. elective (e.g., Goldberg, 1964), or homogeneous vs. heterogeneous (e.g., Longstaff, 1932) classes; lectures vs. group discussion (e.g., Guetzkow, Kelly, & McKeachie, 1954; Hurst, 1963); lectures vs. independent study or self-study (e.g., Koenig & McKeachie, 1959; Ulrich & Pray, 1965); face-to-face vs. televised instruction (e.g., Gulo & Nigro, 1966; Husband, 1954); textbook vs. programmed reading (e.g., Goldberg, Dawson, & Barrett, 1964; McGrew, Marcia, & Wright, 1966; Rawls, Perry, & Timmons, 1966; Ripple, 1963; Young, 1967); and variations among "teaching styles" (e.g., Coats & Smidchens, 1966; Haines & McKeachie, 1967; McKeachie, 1954, 1958, 1968; McKeachie, Lin, Milholland, & Isaacson, 1968), or grading policies (e.g., Goldberg, 1965), or feedback methods (e.g., Anderson, White, & Wash, 1966; Sassenrath & Garverick, 1965). Examples of research on the effects of different student outputs include such comparisons as those between quiz and essay examinations (e.g., Guetzkow, Kelly, & McKeachie, 1954), and among various frequencies of quizzes (e.g., Fitch, Drucker, & Norton, 1951; Longstaff, 1932).

Educational research of both types has been reviewed by Wolfle in 1942, Good in 1952, and later by McKeachie (1961, 1962, 1963). An excellent summary of research on the comparative effectiveness of various teaching procedures has recently been published (Dubin and Taveggia, 1968), and consequently these studies will not be reviewed again here. With relatively few exceptions, the overwhelming finding that has emerged from the hundreds of studies of both kinds is that differing college instructional procedures do not appear to produce any consistent differences in average course achievement.

At least three hypotheses have been proposed to account for this general finding. In the first place, it may be that most of the failures to find differences between teaching conditions have foundered on the shoals of crude criterion measures. Perhaps all instructional techniques differentially affect students to some degree, but present instruments simply are not sensitive enough to detect these differences. For example, critics of studies comparing televised with face-to-face instruction have attempted to minimize the evidence that televised instruction appears to produce no more learning than traditional instruction by suggesting that tests tapping visual content would demonstrate such a superiority. While it is reasonable to assume that most measures of academic achievement could be improved, nonetheless when one considers the special attention given to criterion measurement in a host of previous studies (e.g., Guetzkow, Kelly, & McKeachie, 1954), it is doubtful whether faulty criteria per se can be blamed for most of the negative findings.

A second hypothesis which could account for the lack of differences between instructional techniques points an accusing finger at the methods, themselves. Just as extremist political groups have accused Republicans and

Democrats of providing the voter with "no real choice," so some critics of past educational research have deplored the lack of imagination of college instructors in finding any radically different types of instructional formats. While college professors are increasingly being viewed as "traditional" and "conservative" (in practice if not in ideology), is it reasonable to suppose that such diverse instructional procedures as lectures, programmed textbooks, drill instruction, telecourses, group discussions, and independent study offer no real choice?

A third explanation for the failure to find significant differences among teaching methods stems from the belief that neither the instruments nor the teaching procedures are at fault, but rather that college instruction is a more complicated research area than had initially been assumed. The heart of the third hypothesis lies in the assumption that there is an interaction between teaching methods and characteristics of the learner, and that the techniques which are the best for some students may be the worst for others. McKeachie, for example, has written:

> "One possible partial explanation for the meager findings. . . is that teaching methods affect different students differently. Students who profit from one method may do poorly in another, while other students may do poorly in the first method and well in the second. When we average them together we find little overall difference between methods. . ." (McKeachie, 1961; p. 111-112).
>
> "Our concern that opportunities for individualized instruction be protected is related to an awareness that differences between

students are inadequately cared for by our usual teaching methods. Experienced teachers have felt for years that no single teaching method succeeds with all kinds of students. It is possible that one of the reasons for the host of experimental comparisons resulting in nonsignificant differences is simply that methods optimal for some students are detrimental to the achievement of others. When mean scores are compared, one method thus seems to be no different in its effect from any others" (McKeachie, 1962; p. 351).

The crux of this third hypothesis lies in the concept of a "trait-by-treatment interaction" in all human affairs--and all psychological research. This concept has begun to gain some currency through the thoughtful and lucid exposition by Lee Cronbach (1957) in his A.P.A. presidential address and the related monograph by Cronbach and Gleser (1957, 1965) on the application of decision-theoretic models to problems of personnel classification. As Cronbach has written:

> "My argument rests on the assumption that such aptitude-treatment interactions exist. There is, scattered in the literature, a remarkable amount of evidence of significant, predictable differences in the way people learn. We have only limited success in predicting which of two tasks a person can perform better, when we allow enough training to compensate for differences in past attainment. But we do find that a person learns more easily from one method than another, that this best method differs from person to person, and that such between-treatments differences are correlated with tests of ability and personality" (Cronbach, 1957; p. 681).

A more recent explication of this position can be found in a chapter entitled "How can instruction be adapted to individual differences?" (Cronbach, 1967) in a book on "Learning and Individual Differences" (Gagne, 1967)--a volume which may owe its very existence to Cronbach's previous arguments.

Pervin (1968) has recently reviewed the experimental literature on trait-by-treatment interaction, or in his words on "individual-environment fit." Pervin "assumes that for each individual there are environments (interpersonal and noninterpersonal) which more or less match the characteristics of his personality. A 'match' or 'best-fit'. . . of individual to environment is viewed as expressing itself in high performance, satisfaction, and little stress on the system whereas a 'lack of fit' is viewed as resulting in decreased performance, dissatisfaction, and stress in the system" (Pervin, 1968; p. 56).

One concrete example may help to clarify the nature of such potential interactions; Kagan (1967) has recently reported the following study:

> "The hypothesis can be simply stated. An individual will attend more closely to an initial stranger with whom he feels he shares attributes than to a stranger with whom he feels he does not share attributes, other things [being] equal. . . . The subjects in this study were 56 Radcliffe freshmen and sophomores preselected for the following pair of traits. One group, the academics, were rated by four judges--all roommates--as being intensely involved in studies much more than they were in dating, clubs, or social activities. The second group, the social types, were rated as being much more involved in dating and social activities than they were in courses or grades. No subject was admitted into the study unless all four judges agreed that she fit one of these groups.

> "Each subject was seen individually by a Radcliffe senior, and told that each was participating in a study of creativity. The subject was told that Radcliffe seniors had written poems and that two of the poets were selected by the Harvard faculty as being the best candidates. The faculty could not decide which girl was the more creative and the student was going to be asked to judge the creativity of each of two poems that the girls had written. The subjects were told that creativity is independent of IQ for bright people and they were told that since the faculty knew the personality traits of the girls, the student would be given that information also. The experimenter then described one of the poets as an academic grind and the other as a social activist. Each subject listened to two different girls recite two different poems on a tape. Order of presentation and voice of the reader were counterbalanced in an appropriate design. After the two poems were read the subject was asked for a verbatim recall of each poem. . . . The academic subjects recalled more of the poem when it was read by the academic model than by the social model; whereas, the social subjects recalled more of the poem when it was read by the social model than the academic model. . . . Distinctiveness of tutor is enhanced by a perceived relation between learner and tutor" (Kagan, 1967; pp. 139-140).

For other illustrations of such trait-by-treatment interaction effects, see Carney, 1966; Carson, Harden & Shows (1964); Colquhoun & Corcoran (1964); Hoehn & Saltz (1956); Klett & Moseley (1965); Megargee, Bogart, & Anderson (1966); and Paul & Erickson (1964).

Studies of the interaction hypothesis within the context of college instruction date back at least a decade or two (e.g., Wispe, 1951), although only recently have there been any concerted efforts to explore the hypothesis in a systematic manner. The research programs of the Siegels at Miami University (e.g., Siegel & Siegel, 1964, 1965, 1966, 1967) and McKeachie and his associates at the University of Michigan (e.g., Koenig & McKeachie, 1959; McKeachie, 1958, 1961, 1968; McKeachie, Isaacson, Milholland, & Lin, 1968; McKeachie, Lin, Milholland, & Isaacson, 1966) are based on this hypothesis, as are a number of single studies by other investigators (e.g., Beach, 1960; Denny, Paterson, & Feldhusen, 1964; Heath, 1964; Lublin, 1965; Smith, Wood, Downer, & Raygor, 1965; Snow, Tiffin, & Seibert, 1965). A few investigators have explored this hypothesis among high school or junior high school students (e.g., Osburn & Melton, 1963; Ripple, Glock, & Millman, 1967) and military personnel (e.g., Tallmadge, 1968; Tallmadge, Shearer, Greenberg, & Chalupsky, 1968). Reviews of the literature on the interaction hypothesis in college instruction can be found in McKeachie (1962, 1963, 1968), and thus these studies need not be summarized again here.

Unfortunately, most of these efforts to demonstrate trait by teaching method interaction effects have not been very successful. While a number of significant interactions have occurred in isolated investigations (e.g., Beach, 1960; Domino, 1968; Heath, 1964; Paul & Ericksen, 1964; Snow, Tiffin, & Seibert, 1965; Tallmadge, Shearer, Greenberg, & Chalupsky, 1968), they have yet to be replicated. The few attempts at replication of previous interactions have been--by and large--somewhat discouraging (e.g., Gruber & Weitman, 1962; Koenig & McKeachie, 1959; McKeachie, 1958, 1961, 1963; McKeachie, Lin, Milholland, & Isaacson, 1966; Siegel & Siegel, 1964, 1965, 1966). In addition, quite a number of published studies--not to mention the hidden mass of unpublished ones--sought, but did not find, any significant trait by method interactions at all (e.g., Anderson, White, & Wash, 1966; Goldberg, 1964, 1965; Goldberg, Dawson, & Barrett, 1964; Guetzkow, Kelly, & McKeachie, 1954; Lublin, 1965; Ripple, Glock, & Millman, 1967; Sassenrath & Garverick, 1965; Tallmadge, 1968).

Why has so appealing an hypothesis borne such fragile fruit? First of all, it is important to recognize the sheer statistical problems associated with the demonstration of a significant interaction, since the classic general linear model first attempts to express all of the covariance in terms of main effects and uses only the residual covariance for tests of interaction effects (Cohen, 1968; Goldberg, 1968; Hoffman, 1968; Hoffman, Slovic, & Rorer, 1968). As Rorer (1967) and Yntema & Torgerson (1961) have demonstrated, there is a large class of interactive processes which will produce observations quite easily predictable by a linear additive model (i.e., the main effects alone). In the use of linear regression or analysis of variance techniques, a non-significant interaction term is no guarantee that the underlying process is not an interactive one. Clearly, if we wish to take the interaction hypothesis seriously, we must find some new means of testing for interaction effects, though this may well violate, in some sense, both the "law of parsimony" and the "law of conventional significance testing."

However, there is another--and even more serious--reason why past efforts to demonstrate stable trait by teaching method interactions have typically failed. Again Cronbach has provided the key:

> "Applied psychologists should deal with treatments and persons simultaneously. Treatments are characterized by many dimensions; so are persons. The two sets of dimensions together determine a payoff surface. For any practical problem, there is some best group of treatments to use and some best allocation of persons to treatments.

> We can expect some attributes of persons to have strong interactions with treatment variables. These attributes have far greater practical importance than the attributes which have little or no interaction. In dividing pupils between college preparatory and non-college studies, for example, a general intelligence test is probably the wrong thing to use. This test, being general, predicts success in all subjects, therefore tends to have little interaction with treatment, and if so is not the best guide to differential treatment. We require a measure of aptitude which predicts who will learn better from one curriculum than from the other; but *this aptitude remains to be discovered*. Ultimately we should design treatments, not to fit the average person, but to fit groups of students with particular aptitude patterns. Conversely, *we should seek out the aptitudes which correspond to (interact with) modifiable aspects of the treatment*" (Cronbach, 1957; pp. 680-681). [Italics added.]

In the above paragraph, Cronbach has made two important points: (*a*) that individuals (and treatments) must be conceptualized in a *multivariate* paradigm (e.g., Cattell, 1957; Siegel & Siegel, 1967), and (*b*) that those individual difference measures which have gained the widest currency as general predictors are the *least* likely candidates for being good differential (or interaction) ones. What is needed, therefore, is an extensive search for precisely those measures which, while not showing great promise as general predictors, turn out to be consistently associated with interaction effects.

Yet, virtually all previous studies of trait by teaching method interactions have utilized only a few personality measures, and these typically have been selected because of their easy availability (e.g., sex) and/or because of their previously demonstrated value as general predictors (e.g., G.P.A., scholastic aptitude, anxiety, sociability). For example, in a systematic research program on college instruction which is explicitly both multidimensional and interaction-focused, Siegel and Siegel (1964, 1965, 1966, 1967) have typically utilized only three to five personality measures (each a dichotomized variable)--at least two of which (scholastic ability and prior knowledge of course content) are among the sort of general predictors rather unlikely to serve much of an interactive function. And, in the other large-scale research project on the interaction hypothesis, McKeachie and his associates have typically utilized an equally small set of personality measures, primarily the projective-based (and notoriously unreliable) scores for need Achievement, need Power, and need Affiliation, plus once again two general predictors (scholastic aptitude and test anxiety)--all five being rather unlikely candidates for an interaction role.

While the directors of both research programs might argue that the personality measures they utilize are "theory-based"--stemming on the one hand from a general theory of instruction (Siegel & Siegel) and on the other from a general theory of motivation (Atkinson & McKeachie)--it is doubtful whether either "theory" actually dictated these measurement decisions. For, at the moment, we have few theories in psychology--and none in college instruction--which specify the number and nature of those personality characteristics predisposing students to achieve differentially in different college courses (see Bruner, 1961, 1966; Jones, 1968; Siegel, 1967; Skinner, 1968).

What is needed for the development of such a theory is a broad band-width assessment of college students who are randomly assigned to at least two rather diverse instructional formats. If a comprehensive set of present-day psychometric measures are tried, some may turn out to be useful interaction variables. Or, if the techniques now extant to construct such instruments implicitly guarantee their uselessness in this role, a new set of measures will have to be developed. In any case, as Cattell has so cogently stated elsewhere:

> ". . . the most revolutionary transitions in sciences have usually occurred through methodological innovation rather than grand and bookish theories. A new direction and power is usually given by devices--as by the microscope, the telescope, and the electron tube, or more subtly by stereochemistry or the differential calculus--by the light of which all can see emerging new theories. These methodological inventions solve new kinds of problems and do so, moreover, with altogether more exact standards of what constitutes a solution. The more exact theories readily enough follow, because they are made possible by the new vision" (Cattell, 1966; p. viii).

If the interaction hypothesis is a fruitful one--i.e., if powerful interactions between course treatments and some student personality traits actually exist in nature--then clearly it is time to try a broad-band search to find measures of such traits. Two tactics may prove necessary. First should come a systematic empirical sweep through already-existing personality measures to mine off the most promising interaction variables. However, if the existing lode appears to be empty, then new measures may have to be developed with this specific goal in mind. These are precisely the twin aims of the present research project. Hopefully, its "methodological innovations"--if replicated in subsequent empirical explorations--may then serve to guide new theoretical developments.

While it would be desirable to sample comprehensively both from the large set of potential personality traits and the smaller--but still considerable--set of instructional treatments, any one project will be forced to restrict its scope. The present research program is predicated on the belief that--at this stage--comprehensive coverage of personality traits is more crucial than equal coverage of instructional formats. Consequently, a broad-band set of personality measures was included in the present project, and college instructional procedures were limited to four--two of which lie near the poles of an important instructional continuum: the degree of structure provided the student by the course format. If personality measures can be found which interact with treatments classified as either relatively "structured" or "unstructured," then future research can expand the scope of this investigation to other variations in instructional treatment.

However, even within the set of personality measures some sampling is necessary; for example, one could utilize the 80 aptitude factors developed within the framework of Guilford's (1967) model of the structure of the intellect; or conversely, one could opt to exclude aptitude tests and instead focus on other personality measures. While both approaches must be tried, the present project utilized non-cognitive measures. And, in order to collect a large number of such scores from an even larger number of college students, it was necessary to eschew all individually-administered instruments (both projective techniques--a set easily eliminated on other grounds--and "objective tests of personality" [e.g., Cattell & Warburton, 1967]--a less easily defended choice).

An Overview of the Present Research Project

The general goal of this research program was to discover those personality characteristics which differentiate college students who tend to learn more effectively from one instructional format than from some other, so that ultimately instructional procedures can be more optimally aligned with individual differences among students. Two college courses were studied concurrently, and four different teaching conditions were utilized in each course. A comprehensive battery of structured personality inventories was administered to each of the students, and three types of criterion measures were collected in both courses.

In Chapter II, the methodology of the project is summarized, and the procedures used in the two experimental courses are detailed. Chapter III focuses solely on main effects--those due to treatment variables (i.e., the relationships between the instructional conditions and the course outcomes), and those arising from the personality variables (i.e., the relationships between scale scores and the criterion measures). Chapter IV presents the major trait-by-treatment interactions based upon the *a priori* personality scales. Chapter V describes the construction of new empirical interaction scales and presents the results using this strategy of scale construction. In Chapter VI, the major findings are reviewed and discussed. Finally, Chapter VII summarizes the entire Report.

Chapter II

PROCEDURES

The Subjects

The project was carried out within the framework of two concurrent Psychology courses, so that any significant findings from one course could be immediately replicated in a course containing the same general sort of students (i.e., predominantly college sophomores) exposed to material of approximately the same level of difficulty but in another content area. The two courses, Individual Differences and Developmental Psychology (Course A) and Personality (Course B), formed the last pair of a three-pair sequence of courses at the Introductory Psychology level at the University of Oregon in the Spring Quarter of 1965. Students were allowed to choose one course of a pair during each of three academic Quarters, thereby fulfilling the requirements for the Introductory Psychology sequence. Of the 892 students initially electing either of these two courses, complete criterion data were available for 806--the sample used in most of the data analyses.

The Teaching Methods

Students in each of the two experimental courses were assigned on a nonsystematic basis to one of four types of instructional formats.* These experimental treatments included two forms of instructor "input" (Traditional lectures vs. Self-study instruction) and two forms of student "output" (Multiple-choice quizzes vs. Integrative papers), combined to form the four-fold experimental design displayed in Table 1.

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*Students were not allowed any choice of teaching method; they did not know before classes began that there was more than one method being offered, and transfers between sections were permitted only in a few exceptional cases.

Table 1

The Experimental Design

		Instructor Input	
		Lecture (L) Instruction	Self-study (S) Instruction
Student Output	Quiz (Q) Sections	LQ_1, LQ_2	SQ_1, SQ_2
	Paper (P) Sections	LP_1, LP_2	SP_1, SP_2

		Course A		Course B	
		L	S	L	S
Number of Subjects with Complete Criterion Data	Q	110	95	94	93
	P	86	90	115	123

Insert Table 1 about here

Within each course, all students in the four LQ and LP sections met together in one large lecture hall to receive formal lectures on Mondays and Wednesdays of each week. They then met in smaller sections for one hour later in the week. Students in the four SQ and SP sections had no formally scheduled class meetings on Mondays and Wednesdays, but instead were encouraged to use the additional two hours per week for extra reading and studying. A comparison of the performance of the students in the Lecture (LQ and LP) with those in the Self-study (SQ and SP) sections provides information regarding the differential effects of traditional lectures vs. self-study instruction.

Students in the LQ and SQ sections were administered four multiple-choice quizzes during the Quarter, spaced approximately two weeks apart, two during the first half of the course and two more during the second half. The quizzes, which were about 25 minutes in length, covered material included in the assigned sections of the textbooks. After the quiz answer sheets had been collected, the instructor provided the students with the correct answers. Concurrently, students in the LP and SP sections were required to write four integrative essays during the Quarter, to be turned in approximately two weeks apart, two papers due during the first half of the course and two more during the second half. Students were encouraged to examine critically the material included in the assigned sections of the various textbooks, as well as any other material they felt was relevant to the topic being considered.

The quizzes and the papers were graded and returned to the students. The final course grade was determined on the basis of the scores from the quizzes or papers on the one hand, and the scores on two content examinations on the other.

Quiz and paper scores both contributed the same amount (40%) to the final course grade. Consequently, any differences in performance between students in the quiz sections and those in the paper sections should relate to the differential effectiveness of these two instructional procedures, rather than to any differential perceptions of their weight in determining the course grade.

All students in both courses were required to attend the weekly section meetings, where some of the personality measures were administered and the others--taken at home--were collected. Each of these sections was taught by one of four Teaching Assistants, who were advanced graduate students in the Psychology Department at the University of Oregon. Two Teaching Assistants were assigned to each course, each teaching one section using each of the four treatment conditions (e.g., one Teaching Assistant taught sections LQ_1, LP_1, SQ_1, and SP_1 from Course A). Consequently, any effects due to the differing personalities of the Teaching Assistants were uniformly distributed across the experimental treatments, and therefore such effects were not confounded with those of the teaching methods themselves.

While the experimental design for this project allowed a comparison between lecture vs. self-study methods and between quizzes vs. papers, it also permitted an examination of the joint effects of these two aspects of college teaching as scaled on a potentially more general dimension of college instruction: the degree of structure provided by the instructional format. Ordered on this dimension, the LQ sections clearly provided the most structure, while the SP sections were probably as unstructured as are likely to occur at the undergraduate level. Therefore, the differential effects of teaching methods located near the two poles of the structured vs. unstructured dimension (the circled cells in Table 1) could be assessed.

The Personality Measures

While the comparative effects of the different teaching methods are of some interest, the major innovation of the present study over previous ones lies in the administration of a comprehensive battery of personality inventories, in order to discover any interactions between student personality characteristics and the instructional treatments. These personality measures--which are listed in Tables 2 and 3--were chosen (a) to include those scales which on theoretical, or previous empirical, grounds showed any relevance as potential interaction variables (e.g., Siegel & Siegel's [1965] Educational Set Scale), and (b) to span as broadly as possible the range of personality traits presently measured by paper-and-pencil questionnaires and inventories. Some of the personality inventories were administered during the section meetings, while others were distributed to students to be completed at home and returned the following week.

Insert Tables 2 and 3 about here

Partly as an inducement to obtain their cooperation in the completion of the personality inventories, students were told that they could receive their test scores at a later date. About two-thirds of the students initially requested their scores, and one-quarter of the students actually came back six months later to obtain them. Although course grades were not contingent upon completion of the inventories, this task was presented as an integral component of the course work, and attempts were made toward the end of the course to obtain any missing protocols.

It is difficult to estimate the effect of the "captive" nature of this sample on the reliability of the research data obtained. At the time the course was being conducted, it seemed apparent that some students were not attending

Table 2

The Student Characteristics Assessed in this Project

			Administration	
Administered to the Total Sample	No. of Items	No. of Scales Scored[a]	Week No.	Home vs. Class
Published Inventories				
California Psychological Inventory (CPI)[*]	480[b]	49	2	Home
Survey of Study Habits & Attitudes (SSHA)	75	8	3	Class
Adjective Check List (ACL)[*]	300	26	3	Home
Welsh Figure Preference Test (WFPT)	400[b]	23	6	Class
Edwards Personal Preference Schedule (EPPS)[*]	225[b]	15	6	Home
Minnesota Multiphasic Personality Inventory (MMPI)	566[b]	75	7	Home
Strong Vocational Interest Blank (SVIB)	405	97	8	Class
Non-Published Inventories and Scales				
Oregon Instructional Preference Inventory (OIPI)[*]	84	-	1	Class
Biographical Inventory (BI)[c]	26	-	3	Class
Bass' Social Acquiescence Scale (SAS)	56	7	3	Class
Reported Behavior Inventory (RBI)[*]	250	16	4	Home
Composite Personal Reaction Inventory (CPRI)[c]	151	7	8	Home
Siegel & Siegel's Educational Set Scale (ESS)[*]	93	7	8	Home
Composite Choice Preference Inventory (CCPI)[c]	156	12	9	Home
Other Measures	-	23	-	-
Sex				
Class in college				
College grade point average (GPA)				
Scholastic Aptitude Test: Verbal (SAT-V) and Mathematical (SAT-M) Scores				
Predicted Peer Ratings (18 CPI Scales)				
Each Administered to (Different) Half-Sample				
16 Personality Factor Questionnaire (16PF)	187	23	5	Home
Motivation Analysis Test (MAT)	208	45	5	Home

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[*] Inventories for which the new empirical interaction scales were constructed.

[a] Does not include the empirical interaction scales, nor the "deviancy vs. commonality" and "response bias" scales constructed for each of the inventories.

[b] Includes 12 (CPI), 20 (WFPT), 15 (EPPS), and 16 (MMPI) duplicated items.

[c] See Table 3.

Table 3

The Variables Included in the Composite Personal Reaction Inventory, the Composite Choice Preference Inventory, and the Biographical Inventory

	No. of Items	No. of Scales Scored
Composite Personal Reaction Inventory (CPRI)		
Barron: Originality Scale	22	1
Marlowe-Crowne: Social Desirability Scale	33	1
Walk: Intolerance of Ambiguity Scale	8	1
Sarason: Test Anxiety Scale	16	1
Sarason: Need for Achievement Scale	30	1
Sarason: Lack of Protection Scale	27	1
Vogel-Raymond-Lazarus: Achievement Values Scale	15	1
Composite Choice Preference Inventory (CCPI)		
Liverant-Scodel: Locus of Control Scale	23	1
Allport-Vernon-Lindzey: Study of Values (Part I)	30	6
Zuckerman: Sensational-Seeking Scales	34	3
Forced-Choice Dogmatism Scale	40	1
Forced-Choice F-Scale	29	1
Biographical Inventory (BI)		
Number and type of previous Psychology courses	3	
Satisfaction with previous Psychology courses	2	
Plans for future Psychology courses	1	
College major and graduate school plans	2	
Occupational choice	2	
Present and past places of residence	2	
Father's occupation and education	2	
Mother's education	1	
Birth order and number of siblings	3	
Parents' present marital status	1	
Student's marital status	1	
Employment status and college financing	2	
Expected course grade and expected G.P.A.	3	
Number of friends in the course	1	

carefully to the research tasks, and therefore attempts were made to identify those students who may have been less than candid when taking each inventory. One or more of the following methods were available to detect potentially invalid protocols: (a) visual inspection of the answer sheets to eliminate obviously invalid protocols (e.g., many items left blank, all answers marked "True," etc.), (b) construction of "response deviancy" scales for each of the inventories, by identifying a set of items with extreme response imbalance in the present sample and then scoring each subject's response protocol on each of the new scales in order to identify grossly deviant protocols, (c) analysis of responses to the repeated items in the CPI, MMPI, EPPS, and WFPT--and the 167 identical items common to the CPI and MMPI--to eliminate subjects responding inconsistently, (d) use of previously constructed "response bias" and "faking" scales on the CPI (e.g., Cm, Wb, Gi) and the MMPI (e.g., L, F, K, F-K, Sd, Mp), (e) comparison of "subtle" vs. "obvious" measures of the same trait, where both were available (e.g., the MMPI), (f) the analysis of canonical correlations among all sets of inventory scales (e.g., the 18 CPI vs. the 15 EPPS scales) to develop test-to-test predictability equations on which each protocol could be scored and deviant protocols eliminated, (g) inspection of the four questions on the Course Evaluation Questionnaire (see Appendix B) which dealt with student reactions to the personality inventories, in order to separate students who claimed to enjoy taking the inventories from those who did not.

Methods (a) and (b) were used for all of the inventories, and methods (c) through (g) were employed with some of them. These analyses suggested that the proportion of subjects in the project who provided unreliable inventory data was not appreciably greater than might be expected in any sample of subjects administered a long battery of psychological tests. While further work on this question is still underway, it is important to realize that any random errors introduced into the personality data through invalid protocols will serve to attenuate all relationships between inventory scores and other measures and thus to hide interactions which, under better conditions of test administration, might have appeared. Therefore, to the extent to which the reader judges this problem to be a significant one, he must entertain all the more credence in those relationships uncovered in this project--relationships which appeared through the fog of these less than ideal test-taking conditions. For a further discussion of this potential source of error, see Chapter VI.

Criterion Measures: The Initial Set

Three general types of criteria were multiply assessed in both of the experimental courses: (*a*) knowledge of course content, (*b*) the amount of extracurricular (non-graded) reading the students carried out, and (*c*) satisfaction with the instructional treatments. Each of these three classes of criteria will be discussed in turn.

Course Achievement. Two content examinations were administered in each course, one approximately half-way through the term, and the other at the end of the course. Each examination included 10 questions previously included in the quizzes and from 60 to 80 new questions. While only the latter were used as measures of course achievement, the inclusion of the former allowed some estimate of the effects of sheer practice on examination performance. The second examination in each course included, in addition to 60 multiple-choice questions, an integrative essay covering the content of the course. Thus, both divergent thinking (as measured by an essay) and convergent thinking (as measured by a multiple-choice examination) were available as measures of the course achievement criterion.

Amount of extracurricular reading. The only unique criterion to be employed in this project was one assessing the extent to which students read relevant material which, while available to everyone, was explicitly understood as not involved in the determination of the course grade. All students in both courses were asked to buy a preselected set of 20 reprints from the Scientific American. These reprints, the same set for students in both courses, were sold along with the textbooks by the University bookstore as material required for each course. At the first class meeting, all students were given a course reading list; weekly reading assignments from four paperback textbooks were listed as "Required Reading" and the Scientific American reprints most relevant to each topic were listed as "Supplementary (Optional) Reading." On the reading lists and on a course syllabus distributed at the same time, the following statement appeared: "Reading material assigned as 'Supplementary Reading' will not be used for grading purposes." In addition, the course instructors emphasized in the first classes that while the reprints were relevant to the course and should prove helpful in understanding the textbook material, they would not be used for grading purposes.

The use of these twenty Scientific American reprints thus provided an opportunity for assessing the extent to which the different teaching methods encouraged extracurricular reading. Questions about each reprint were written to assess whether the student had read this material; these questions were constructed so as to be quite easy for anyone who had read the reprint, while simultaneously being extremely difficult for anyone who had not read it. All questions were pre-tested on samples of students from another college, half of whom had read, and half had not read, the reprints; from a larger pool of items, 20 were selected which maximally differentiated the two groups. Consequently, scores on this test provided relatively precise information on the extent to which each student had read this extra material. This test was administered after the final examination in the course, with instructions to the students that these scores were only to be used for research purposes. In addition, one of the questions on the Course Evaluation Questionnaire, administered at the end of the term, asked _directly_ for the number of reprints read.

Satisfaction with the courses. At the very end of the term, a 42-item Course Evaluation Questionnaire was administered in both courses. While students were asked to sign these evaluation forms, care was taken to insure the student that his candid opinions could not affect his course grade. The Evaluation Questionnaire included rating scales tapping attitudes toward different aspects of the course, many of which had been developed in previous studies of college instruction (e.g., Goldberg, 1964, 1965). The Course Evaluation Questionnaire is included in this Report as Appendix B.

Finally, a short measure of group morale--in effect, a morale thermometer--was administered in all sections of each course every two weeks throughout the term. Students were asked to rate their satisfaction with the course; these ratings were made anonymously to relieve any possible fear that the evaluations might influence course grades. Since measures of group morale were gathered on six occasions throughout the term, it was possible to plot a morale curve for each section over time and thus to compare teaching methods in terms of the relative pattern of these morale curves. However, since this instrument was administered anonymously, it was not possible to relate student personality measures to individual morale curves. Since the findings stemming from the "morale thermometer" are not central to the interaction hypothesis which guided the research project, they are not included in the present report.

Criterion Measures: The Final Set

Of the 42 questions in the Course Evaluation Questionnaire (See Appendix B), 15 dealt with aspects of the courses which were unique to one or two cells of the experimental design (e.g., the value of the lectures), 8 concerned reactions to the textbooks, and 15 dealt with general--but not criterial--issues. The remaining 4 questions, listed in Table 4, were intercorrelated, along with four achievement test scores: scores from (*a*) the first (multiple-choice) examination, (*b*) the multiple-choice portion of the second examination, (*c*) the essay portion of the second examination, (*d*) the special questions from the second examination covering the contents of the (non-graded) *Scientific American* reprints. The correlations among these 8 outcome variables, separately computed in each of the 2 experimental courses, are presented in Table 5. These two correlation matrices were factor analyzed, using both a principal factors (R^2 in the diagonal) and a principal components (unity in the diagonal) solution--each of which was rotated by one oblique and two orthogonal procedures. The data turned out to be so cleanly structured that all solutions gave quite similar results. The rotated factor structures from each course, using the principal components solution with a Varimax rotation, are presented in Table 6.

Insert Table 4 about here

Insert Table 5 about here

Table 4

Four Criterion Variables from the Course Evaluation Questionnaire

Variable	Question	Response Options
4	How satisfied are you at the present time with this course?	1 - 9 (Extremely satisfied → Extremely dissatisfied)
5	What is your reaction to the manner in which this course was taught?	1 - 7 (Very disappointed → Very delighted)
6	How does the probable long-range value for you of this course compare with all other courses you have had in college?	1 - 5 (Lowest 10% → Highest 10%)
8	How many *Scientific American* reprints--of those assigned as supplementary reading--have you read up to this time?	0 - 9 (None → 17 or more)

Table 5

Intercorrelations among the Eight Outcome Variables in Each of the Two Courses

											Course A	
			1	2	3	4	5	6	7	8	Mean	σ
First exam		1		.60	.30	-.11	.07	.19	.06	.18	60.9	7.1
M-C score		2	.56		.28	-.05	.01	.07	.11	.21	41.6	5.8
Essay score		3	.35	.31		-.04	-.01	.07	.01	-.02	50.2	9.8
Satisfaction		4	-.20	-.07	.01		-.74	-.53	-.05	-.06	5.7	2.2
Reaction		5	.16	.01	.05	-.71		.57	.03	.00	3.4	1.7
Long-range Value		6	.14	.10	.05	-.47	.49		.06	.04	2.8	1.2
Reading: Test score		7	.15	.15	.13	.00	.01	.07		.44	2.3	2.5
Reading: No. read		8	.27	.30	.08	-.06	.03	.01	.39		7.9	3.0
Course B	Mean		51.1	40.6	50.1	5.9	2.9	2.9	2.3	8.0		
	σ		6.3	5.5	10.1	2.2	1.6	1.1	2.5	3.3		

Note: -- Correlations from Course A (*N* = 381) are listed above the main diagonal; those from Course B (*N* = 425) are listed below the diagonal.

Note the virtual identity of the factor structures in the the two courses.

Insert Table 6 about here

Using the analyses presented in Table 6, factor scores were computed for each student in each course, and these three factor scores (Achievement, Satisfaction, and Amount of Non-graded Reading)--plus the essay and multiple-choice sub-scores from the second examination--were utilized as the five major outcome variables in all of the subsequent analyses. These five criteria, then, include three measures of course achievement (multiple-choice examination score, essay examination score, and over-all achievement factor score), one global measure of course satisfaction, and one measure of non-graded reading.

Statistical Analyses

Since the primary focus of this investigation was upon the demonstration of trait-by-treatment interaction effects, some comments are now in order concerning the procedures used to recognize--and to test the statistical significance of--such interactions. There are at least two classes of statistical test used for demonstrating a significant interaction effect. The first, and most common, is by means of a statistically significant F-ratio for a particular interaction line in an analysis of variance (ANOVA) or covariance (ANOCA). The second is by means of a statistically significant difference between two or more correlation coefficients ($\underline{r}$) or between two sets of regression weights obtained from linear regression analyses ($\underline{R}$). Both classes of procedures are based upon an identical set of assumptions, namely those of the general linear model (e.g., Cohen, 1968), and both were utilized in the present project.

In using the ANOVA or ANOCA procedures to establish significant interaction

Table 6

The Factor Structure of the Eight Outcome Variables in Each of the Two Courses

	I*		II*		III*		h^2	
Variable	A	B	A	B	A	B	A	B
First exam	.80	.76					.66	.63
M-C score*	.73	.69					.55	.52
Essay score*	.39	.45					.15	.20
Satisfaction			-.83	-.83			.69	.69
Reaction			.90	.86			.80	.75
Long-range Value			.64	.56			.42	.32
Reading: Test score					.90	.90	.82	.84
Reading: No. read					.48	.41	.23	.18

Note: -- All loadings > .20 are tabled. Course A: N = 381; Course B: N = 425. Results are from a normalized Varimax rotation of the principal components analyses (unities in diagonal).

*Variables used for subsequent analyses (3 factor scores + 2 test scores).

effects, one begins with a set of nominal (categorical) measures for each of two or more independent (and orthogonal) variables; the dependent variable is the outcome or criterion score of interest to the investigator. For example, using the present experimental design, we can examine the effects of Lecture (L) vs. Self-study (S) instruction, and Quiz (Q) vs. Paper (P) sections, upon the outcome variable of course achievement. Using the traditional ANOVA or ANOCA procedures, we can test for the significance of: (a) the L vs. S main effect, (b) the Q vs. P main effect, and finally (c) the L-S x Q-P "interaction effect"--a series of significance tests which are discussed in Chapter III. However, it is important to bear in mind that this particular "interaction" is a treatment-by-treatment one, not a trait-by-treatment interaction of the sort for which we are searching. To test for the latter, we could dichotomize, trichotomize, or generally multichotomize the scores on one or more personality scales of interest (e.g., Anxiety) and then test for the significance of: (a) the L vs. S main effect, (b) the Q vs. P main effect, (c) the High vs. Medium vs. Low Anxiety (A) main effect, (d) the L-S x Q-P (treatment) "interaction," (e) the L-S x A interaction, (f) the Q-P x A interaction, and finally (g) the L-S x Q-P x A interaction--the last three being examples of the sort of interactions we hope to discover. We could then estimate the proportion of the variance in the dependent (criterion) variable "attributable" to each of the seven effects by means of some statistic like ω^2 (Hays, 1963).

This procedure, while useful for variables which are naturally dichotomous (e.g., sex) or otherwise categorical (e.g., place of residence), is a cumbersome one for the mass of personality inventory scale scores of the sort used in this study. For this and other reasons, most of the findings relating to the interaction hypothesis (Chapters IV and V) will be presented in terms of correlational differences. The correlations between each scale score and each of the five outcome variables were computed for the students in each course separately within each of the four cells of the experimental design. These correlations were computed separately for male and for female students. In addition, similar correlations were computed for male and for female students in each of the four experimental treatments:

(L) Lecture (LQ and LP sections combined).
(S) Self-study (SQ and SP sections combined).
(Q) Quiz (LQ and SQ sections combined).
(P) Paper (LP and SP sections combined).

Since this is an exploratory investigation in which the relative significance of the L vs. S and the Q vs. P experimental treatments are unknown, it was decided a priori to analyze the correlational differences between students exposed to the most structured (LQ) and the least structured (SP) sections, and the L vs. S and the Q vs. P teaching conditions. A significant difference in the correlations between students in any pair of these conditions across the two courses can then be interpreted analogously to a significant interaction in an ANOVA analysis which includes one treatment variable having two levels and one personality variable having many (ordered) levels. The procedures for testing the significance of correlational differences on a post hoc basis are detailed in Marascuilo (1966). In the present study, the procedure involved the calculation of Z in the following equation:

$$Z = \frac{Z_1 - Z_2 + Z_3 - Z_4}{\sqrt{\frac{1}{n_1-3} + \frac{1}{n_2-3} + \frac{1}{n_3-3} + \frac{1}{n_4-3}}}$$

where:

Z_{1-4} = the Z-converted correlation coefficients, each involving a test score and a criterion variable.

n_{1-4} = the number of subjects in each condition.

and where conditions 1 and 3 (e.g., LQ) and conditions 2 and 4 (e.g., SP) are equivalent conditions in Course A (1 and 2) and Course B (3 and 4), respectively.

The following two hypothetical interaction effects illustrate this general methodology:

		Course A		Course B	
		L	S	L	S
Criterion A Trait X	Q	-.30	-	-.35	-
	P	-	.30	-	.25
Criterion A Trait Y	Q	.00	-	.05	-
	P	-	.45	-	.50

The first hypothetical interaction, involving Trait X and Criterion A, illustrates the ideal case: a significant negative (or positive) correlation in the LQ cell and one of a similar size but of opposite sign in the SP cell. Such a pattern of correlational differences, which is probably quite rare in psychology, cannot be represented by a linear model (i.e., only main effects) since the population correlation ($r_{X \cdot A}$) is approximately zero. The second hypothetical example (for Trait Y), which is probably more likely to occur, represents cases where a personality measure is significantly related to a criterion among students in one treatment condition and is not so highly related among students in the other. These sorts of interactions are reasonably well predicted by linear models, since the regression lines do not cross, as they do in the first example.

Any significant interactions uncovered in the present study can stem primarily from the Lecture (L) vs. Self-study (S) treatment, e.g.:

	Course A		Course B	
	L	S	L	S
Q	-.30	.30	-.30	.30
P	-.30	.30	-.30	.30

Course A		Course B	
L	S	L	S
-.30	.30	-.30	.30

or from the Quiz (Q) vs. Paper (P) treatment, e.g.:

	Course A		Course B	
	L	S	L	S
Q	-.30	-.30	-.30	-.30
P	.30	.30	.30	.30

	Course A L S	Course B L S
Q	-.30	-.30
P	.30	.30

or from their joint effects, e.g.:

	Course A		Course B	
	L	S	L	S
Q	-.30	.00	-.30	.00
P	.00	.30	.00	.30

These analyses should suggest whether the presence vs. absence of lectures is more important than the use of quizzes rather than papers in producing significant interactions with student personality characteristics, thus serving to guide future replications and extensions of the present findings.

Chapter III

ANALYSES OF THE MAIN EFFECTS

Two major classes of main effects can be considered, namely those stemming from the experimental treatment interventions (the teaching methods) and those stemming from the personality characteristics (the attributes or traits) of the students, themselves. The effects of these two classes of variables upon the five criteria will each be presented in turn.

The Experimental Teaching Methods

The effects of the experimental variations in teaching method were examined by means of analyses of variance for each of the five outcome variables. Table 7 summarizes the results of 10 of these analyses (one for each of the five criteria, separately in each of the two courses). The values in parentheses in Table 7 are the point-biserial correlations between the students' instructional format (e.g., students in lecture sections were coded "0" and those in self-study sections were coded "1") and their scores on the criterion variable. Thus these values, providing an index of the strength of the effects whose significance level is given by the analysis of variance, permit the reader to compare directly the effects due to situations (experimental treatments) with those due to personality traits (student attributes),

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Insert Table 7 about here

Table 7

The Effects of the Experimental Teaching Conditions upon the Five Major Outcome Variables: Analyses of Variance and Correlations

Outcome Variables

Teaching Methods	Course Achievement: Factor Score		Course Satisfaction: Factor Score		Non-graded Reading: Factor Score		Multiple-choice Test Score		Essay Test Score	
	A	B	A	B	A	B	A	B	A	B
L vs. S		L>S						L>S		L>S
		$F=6.1$						$F=10.9$		$F=7.3$
	n.s.	$p<.05$	n.s.	n.s.	n.s.	n.s.	n.s.	$p<.01$	n.s.	$p<.01$
	(-.04)	(-.12)	(-.05)	(.07)	(-.04)	(-.03)	(-.08)	(-.16)	(.00)	(-.13)
Q vs. P	Q>P				P>Q	Q>P	Q>P			
	$F=15.2$				$F=4.7$	$F=7.8$	$F=10.8$			
	$p<.01$	n.s.	n.s.	n.s.	$p<.05$	$p<.01$	$p<.01$	n.s.	n.s.	n.s.
	(-.20)	(-.06)	(.06)	(-.06)	(.11)	(-.13)	(-.17)	(-.06)	(.03)	(.04)
Interaction										
	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Note: -- Course A: N = 381; Course B: N = 425.

L = Lecture Instruction
S = Self-study Instruction
Q = Quiz Sections
P = Paper Sections

Values in parentheses are the point-biserial correlations between teaching conditions and scores on the outcome variable.

using the same index of degree of association (the product-moment correlation).

As Table 7 indicates, the experimental treatment variations did not produce any statistically significant main effects common to both of the two courses, a finding concordant with three decades of previous instructional research. All treatment effects were either non-significant in both courses (9 out of 15 analyses), significant in one but not the other course (five analyses), or significant in both courses but opposite in direction of effect (one analysis). Consequently, these results generally confirm the findings from past studies, namely that differences in instructional conditions do not show either sizeable or replicable main effects.

While there were no differences in over-all course satisfaction on the part of students assigned to differing instructional procedures, there were some interesting differences between experimental treatments in the students' implied choices for future courses. One question on the Course Evaluation Questionnaire, administered at the last session of each course, asked each student to indicate which type of section he "would now prefer" if he were enrolling in the course "at the present time." Table 8 presents the proportions of students in each of the four instructional formats who would elect each of the four types of instruction. Note that there was no consistent final preference for either Lecture or Self-study instruction (52%

Insert Table 8 about here

Table 8

The Relationship between Students' Experience in a Particular Treatment and Their Later Instructional Preferences (Both Courses Combined)

	Students Enrolled in:				
Final Preference For:	Lecture Quiz	Self-study Quiz	Lecture Paper	Self-study Paper	All Sections
Lecture Quiz	.46	.41	.29	.31	.37
Self-study Quiz	.36	.41	.23	.18	.29
Lecture Paper	.10	.08	.21	.22	.15
Self-study Paper	.09	.10	.26	.29	.19
Total	1.00	1.00	1.00	1.00	1.00
N	193	190	197	204	784
	Quiz		Paper		
Quiz	.82		.50		.66
Paper	.18		.50		.34
Total	1.00		1.00		1.00
N	383		401		784

Note: -- Preferences are from the Course Evaluation Questionnaire, administered during the last section meeting. Cell entries are proportions of those students enrolled in each of the four instructional formats. Circled entries represent students electing the treatments to which they had been assigned.

vs. 48%), while there was such a general preference for Quiz sections (66%) over Paper sections (34%). However, this latter choice appeared to have been moderated dramatically by the students' actual course experiences: of those who were assigned to Quiz sections, only 18% elected a Paper section; on the other hand, of those who were assigned to Paper sections, half preferred the same type of section again.

Fortunately, these same students had the opportunity to choose between frequent quizzes and frequent papers at their first section meeting--before they had actually taken any quizzes (or written any papers) in these particular courses; at that time, they responded to a question from the Oregon Instructional Preference Inventory which asked for their choice between "a course with frequent quizzes" and "a course requiring frequent papers." Approximately 20% of the students in the quiz sections and approximately 30% of those in the paper sections claimed an initial preference for writing papers. Consequently, one might hypothesize that about 20% of this student sample would initially prefer writing papers to taking quizzes; while being enrolled in a course requiring papers may raise this proportion a bit, the experience of actually writing papers raises the proportion quite substantially (50%). Since this finding suggests that experiencing an initially unpopular instructional treatment can change students' attitudes towards it, one might consider this fact before assigning students to treatments solely on the basis of their initial preferences.

Finally, one other treatment effect deserves a brief mention. Students in the Quiz sections achieved higher scores than those in the Paper sections on each of the sets of 10 repeated quiz questions which had been embedded in the two content examinations ($p < .01$ on both examinations in both courses);

differences between students in the Lecture and the Self-study conditions were not significant on either examination in either course. While this finding is hardly an electrifying one, it does attest to the fact that students can learn the answers to specific questions from previous quizzes (when adequate feedback is provided), though this learning does not necessarily generalize to other questions covering much the same content.

The Student Personality Characteristics

Table 9 presents the correlations between each of the five criterion variables and six student attributes typically considered to be related to course outcomes (GPA, SAT-V, SAT-M, course motivation, class in college, and sex). Note that the findings were virtually identical in both courses. Sex, class in college, and initial course motivation (whether the course was required or elective) had essentially no correlation with any of the five outcome variables. On the other hand, previous college GPA and the two measures of scholastic aptitude were related to all of the course achievement variables, and a number of these relationships were of quite substantial size (e.g., previous GPA correlated .56 and .52 with the Course Achievement factor score in the two courses, respectively). In general, GPA correlated more highly with the course achievement criteria than did the SAT-Verbal score, which in turn was more predictive of these variables than was the SAT-Mathematical score. None of these measures, however, was related to course satisfaction.

Insert Table 9 about here

A comparison of Tables 7 and 9 highlights the differential effectiveness of experimental treatments (Table 7) vs. student attributes (Table 9) in predicting course outcomes. While neither these treatments nor these attributes

Table 9

The Relationships between Six Student Attributes and the Five Major Outcome Variables

	Outcome Variables									
Student Attributes	Course Achievement: Factor Score		Course Satisfaction: Factor Score		Non-graded Reading: Factor Score		Multiple-Choice Test Score		Essay Test Score	
	A	B	A	B	A	B	A	B	A	B
GPA	.56	.52	-.02	-.02	.16	.25	.48	.45	.28	.24
SAT-V	.46	.42	.00	.02	.27	.26	.45	.41	.26	.18
SAT-M	.29	.23	-.03	.01	.11	.14	.26	.25	.17	.06
Course motivation[a]	.03	.13	.00	.18	.03	.04	.02	.17	-.09	.08
Class in college	.10	.05	-.03	-.05	-.02	.02	.07	.06	.11	.04
Sex	.02	.11	-.08	.06	.04	.05	.08	.05	-.02	.12

Note: -- Course A: $N = 308$; Course B: $N = 369$. All correlations $\geq .15$ are significantly different from zero at $p < .01$.

[a] Self-report of whether the course was selected "primarily to fulfill a college requirement" (0) or "primarily to gain knowledge of the contents of the course" (1).

enable one to predict course satisfaction, the case is very different for indices of course achievement. A substantial proportion (20%-40%) of the variance in achievement was predictable by student attributes, and virtually none by the instructional treatments.

Table 10 provides an even more dramatic illustration of the differing validity of information from various data sources as predictors of the three criteria of course achievement. Correlations are presented separately for male and for female students. In general, the course achievement factor scores were slightly more predictable by all measures than were the multiple-choice test scores, which in turn were considerably more predictable than the essay test scores--a finding which conforms to expectations based upon the probable relative reliabilities of these three criterion indices.

Insert Table 10 about here

The data sources are ordered from the top to the bottom of Table 10 roughly by their over-all validity, though only a subset of the significant predictors from each data source are tabled. For the female sample, the best predictor of the course achievement factor scores was past performance in other courses (GPA) with an average validity ($\bar{r}$) across both courses of .61. The SAT-Verbal score ($\bar{r} = .44$) and the Educational Set Scale ($\bar{r} = .42$) were also highly predictive, followed closely by the female key from the 1956 Revision of the Survey of Study Habits and Attitudes ($\bar{r} = .36$). Two scales from the Strong Vocational Interest Blank for Men ($\bar{r} = .27$) and the Achievement via Independence scale from the CPI ($\bar{r} = .26$), while less valid than the ability measures, were more predictive than any of the instructional effects, which produced essentially zero correlations with the achievement criteria. For the male sample, the results

Table 10

A Comparison of Different Data Sources as Predictors of Course Achievement

		Male Students		Female Students		$\bar{r}$
		A	B	A	B	
Past Performance	GPA	.59**	.52**	.54**	.51**	.54
Aptitude Test Scores	SAT-V	.42**	.44**	.50**	.40**	.44
	SAT-M	.34**	.34**	.25**	.23**	.29
Educational Set & Study Habits	ESS	.18*	.23**	.36**	.34**	.28
	SSHA	.20**	.21**	.26**	.37**	.26
Vocational Interests (SVIB)	Psychologist	.22**	.18*	.29**	.33**	.26
	Economist	.27**	.19**	.25**	.34**	.26
Inventory Predictors of Academic Achievement	CPI-Ai	.21**	.26**	.30**	.27**	.26
	SVIB-Ach	.27**	.15*	.28**	.20**	.22
Instructional Treatments	L vs. S[a]	.01	.05	-.11	.08	.01
	Q vs. P[b]	.01	-.02	.11	-.09	.00
	LQ vs. SP[c]	.02	.02	.00	-.01	.01
	(N)[d]	(186)	(186)	(195)	(239)	(806)

[a] Lecture sections (L) = 0; Self-study sections (S) = 1.

[b] Quiz sections (Q) = 0; Paper sections (P) = 1.

[c] LQ = 0; LP & SQ = 1; SP = 2.

[d] The sample sizes vary slightly from row to row, since not all of the subjects completed each inventory.

$^{*}p < .05$

$^{**}p < .01$

were similar, though all of the personality inventory scales produced more uniform--and somewhat lower--validities ($\bar{r} \approx .20$) than for the female sample.

While these comparisons should be instructive for the continuing debate over the relative contributions of situations (treatments) vs. traits (attributes) as main effects in applied prediction problems (see Chapter VI), the focus of the present project is on potential situation-trait *interactions*. Consequently, let us turn now to the findings which have some direct bearing on the interaction hypothesis.

Chapter IV:

ANALYSES OF THE INTERACTION HYPOTHESIS: THE *A PRIORI* SCALES

The first tactic for discovering any significant interactions between course treatments and student attributes involved a broad band-width pass through already existing personality measures. While the present chapter reports the findings from such an explicitly empirical sweep through more than 350 *a priori* variables, the reader must bear in mind that since the number of personality variables in this study was so large, most--if not all--of the interactions to be presented *could* have arisen by chance alone. A comparison between the number of significant interaction effects uncovered and the number expected by chance is included at the end of this chapter.

Since the following material is rather technical, it may appeal more to the specialist in personality assessment than to the general reader. Consequently, a brief discussion of the overall organization of the chapter may be useful as a guide for the latter. The findings based on each personality inventory are reported in turn. For each inventory, the means and standard deviations of the scales scored in this project are tabled and discussed. Following the technical description of the scales, the most significant interactions involving these measures are presented. For readers interested in only one particular data source, the inventories are discussed in the following order:

Previous GPA, aptitude test scores, etc.	Tables 11-15	Pages 35-38
California Psychological Inventory	Tables 16-20	Pages 38-41
Survey of Study Habits and Attitudes	Tables 21-22	Pages 41-42
Educational Set Scale	Tables 23-24	Page 43
Strong Vocational Interest Blank	Tables 25-30	Pages 43-46

Edwards Personal Preference Schedule	Tables 31-35	Pages 46-48
Gough Adjective Check List	Tables 36-38	Pages 48-50
Welsh Figure Preference Test	Tables 39-42	Pages 50-51
Minnesota Multiphasic Personality Inventory	Tables 43-47	Pages 52-54
Composite Personal Reaction Inventory	Tables 48-51	Pages 54-55
Composite Choice Preference Inventory	Tables 52-54	Pages 56-57
Bass Social Acquiescence Scale	Tables 55-57	Pages 57-58
Reported Behavior Inventory	Tables 58-62	Pages 58-60
Predicted Peer Ratings	Tables 63-68	Pages 60-63

As a summary of the findings from all of the inventories, the most significant interactions with each criterion variable are presented in Tables 70-74 (Pages 65-67).

Previous GPA, Scholastic Aptitude, Sex, Class in College, and Initial Course Motivation

Descriptive statistics for the present sample on previous GPA, scholastic aptitude, sex, class in college, and initial course motivation are presented in Table 11. While the sample was rather evenly split between males (46%) and females (54%), there was a heavy preponderance of sophomores (66%), with some juniors (23%) and a scattering of seniors (8%) and freshmen (3%). Mean scores on the Scholastic Aptitude Test were close to the national average (500). Male students scored slightly higher than females on the mathematical section of the aptitude test, while females scored slightly higher than males on the verbal section. The first year grade point average for the female students was slightly superior to that of their male counterparts.

Insert Table 11 about here

Table 11

Characteristics of the Sample: Sex, Class in College, Course Motivation, Past Academic Performance (GPA), and Scholastic Aptitude

		Males		Females	
		A	B	A	B
Class in College					
	Freshman	5	9	6	6
	Sophomore	106	113	137	172
	Junior	49	45	45	49
	Senior	26	19	7	12
Course Motivation					
	"Required"	108	100	124	135
	"Elective"	78	86	71	104
	(N)	(186)	(186)	(195)	(239)
Past Performance & Scholastic Aptitude					
Mean	GPA	2.53	2.53	2.63	2.60
	SAT-V	503	503	519	515
	SAT-M	534	524	491	470
σ	GPA	.48	.46	.47	.45
	SAT-V	88	79	84	85
	SAT-M	92	92	84	83
	(N)	(145)	(159)	(163)	(210)

On the Course Evaluation Questionnaire, administered at the end of the term, students were asked the following question: "My major reason for enrolling in this course was: (1) primarily to fulfill a college requirement, or (2) primarily to gain knowledge of the contents of the course." While neither of these particular courses was specifically required for students at the University of Oregon, approximately 58% of the sample indicated that they had elected the course "primarily to fulfill a college requirement." One such University requirement makes students complete a year of study in each of three general areas: Arts and Letters, Social Science, and Natural Science. The Introductory Psychology sequence, of which the two experimental courses formed a part, could be used to satisfy either the Social Science or the Natural Science requirement. Consequently, this measure of initial course motivation should be understood as reflecting a contrast between an absolute interest in those courses as opposed to a more limited interest relative to other requirement-satisfying courses.

While neither sex, class in college, nor initial course motivation produced any significant interaction effects in either course, there were a few significant interactions involving previous GPA and the Scholastic Aptitude Test scores. Table 12 presents the correlations between previous grade point average and the course satisfaction outcome variable for students in different teaching conditions.

Insert Table 12 about here

Note that while there was a slight tendency for GPA to be correlated negatively with satisfaction in the Lecture (L) condition and positively in the Self-study (S) condition for the total sample, this effect did not reach statistical significance when students of each sex were analyzed separately.

Table 12

The Correlations between Previous Grade Point Average and the Course Satisfaction Outcome Variable in Different Teaching Conditions

			Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
TOTAL SAMPLE		Q	-.14	.10	-.19	.07	2.00*	-.12	.07	-.13	.08	2.56*
		P	-.05	.04	-.08	.07						
	(N)	Q	(94)	(73)	(81)	(76)		(166)	(142)	(184)	(185)	
		P	(72)	(69)	(103)	(109)						
MALES		Q	-.19	.10	-.28	-.07	2.17*	-.21	.09	-.08	.08	1.95
		P	-.25	.13	.09	.15						
	(N)	Q	(42)	(40)	(40)	(30)		(79)	(66)	(89)	(70)	
		P	(37)	(26)	(49)	(40)						
FEMALES		Q	-.10	.11	-.13	.14	1.05	-.07	.09	-.17	.05	1.78
		P	.11	.08	-.20	.00						
	(N)	Q	(52)	(33)	(41)	(46)		(87)	(76)	(95)	(115)	
		P	(35)	(43)	(54)	(69)						

Note: -- Values in the table are correlations between GPA and the Course Satisfaction Factor Score. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*$p < .05$

Table 13 focuses on the interactions with the non-graded reading outcome variable. For female students, previous GPA and SAT-Verbal scores were more highly related to amount of extracurricular reading in the Quiz (Q) than in the Paper (P) sections. This effect, though statistically significant in the female sample, was not very large.

Insert Table 13 about here

Table 14 presents the interactions with two of the course achievement outcome variables. The results displayed in Table 14 indicate that, for the total sample and for the male subsample, there was a slight tendency for SAT-Mathematical scores to be more highly related to course achievement in the Self-study (S) than in the Lecture (L) sections. For female students, this effect, while in the same direction, was not statistically significant.

Insert Table 14 about here

Finally, Table 15 summarizes one highly significant interaction between previous grade point average and the essay test score. Note that for male students, though not for female students, previous grade point average was related to performance on the essay test for students in the least structured sections (SP) and not so highly related for students in the most structured sections (LQ). For male students, the correlations between GPA and the essay test scores were considerably higher in the Paper (P) than in the Quiz (Q) sections.

Insert Table 15 about here

Table 13

Correlations of Previous Grade Point Average (GPA) and SAT Verbal Scores (SAT-V) with the Non-graded Reading Outcome Variable in Different Teaching Conditions

			Course A		Course B		Z		Course A	Course B	Z
			L	S	L	S					
TOTAL SAMPLE	GPA	Q	.29	.18	.40	.23	2.05*	Q	.24	.32	1.91
		P	.08	.08	.20	.19		P	.08	.19	
	SAT-V	Q	.26	.38	.33	.35	1.09	Q	.33	.35	2.23*
		P	.25	.14	.13	.23		P	.19	.17	
	(N)	Q	(94)	(73)	(81)	(76)		Q	(167)	(157)	
		P	(72)	(69)	(103)	(109)		P	(141)	(212)	
MALES	GPA	Q	.47	.24	.42	.23	1.05	Q	.35	.35	.64
		P	.18	.19	.36	.38		P	.22	.35	
	SAT-V	Q	.31	.19	.22	.36	.28	Q	.25	.28	.76
		P	.27	.16	.06	.27		P	.23	.14	
	(N)	Q	(42)	(40)	(40)	(30)		Q	(82)	(70)	
		P	(37)	(26)	(49)	(40)		P	(63)	(89)	
FEMALES	GPA	Q	.12	.10	.37	.23	1.83	Q	.14	.28	1.96*
		P	-.02	-.07	.07	.04		P	-.04	.05	
	SAT-V	Q	.22	.62	.44	.35	1.25	Q	.39	.40	2.20*
		P	.22	.12	.19	.20		P	.16	.20	
	(N)	Q	(52)	(33)	(41)	(46)		Q	(85)	(87)	
		P	(35)	(43)	(54)	(69)		P	(78)	(123)	

Note: -- Values in the table are correlations with the Non-graded Reading Factor Score. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p $\leq$ .05

Table 14

Correlations of SAT Mathematical Scores (SAT-M) with Two Course Achievement Outcome Variables in Different Teaching Conditions

			Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
TOTAL SAMPLE	Course Achievement: Factor Score	Q	.09	.31	.28	.27						
		P	.30	.59	.13	.24	2.45*	.17	.43	.20	.25	2.24*
	Multiple Choice Test Score	Q	.20	.28	.18	.31						
		P	.16	.50	.13	.31	2.23*	.18	.38	.16	.31	2.44*
	(N)	Q	(94)	(73)	(81)	(76)						
		P	(72)	(69)	(103)	(109)		(166)	(142)	(184)	(185)	
MALES	Course Achievement: Factor Score	Q	.05	.40	.49	.45						
		P	.59	.48	.13	.31	.71	.25	.44	.30	.36	1.19
	Multiple Choice Test Score	Q	.26	.48	.21	.58						
		P	.24	.39	.10	.36	.88	.22	.45	.16	.44	2.42*
	(N)	Q	(42)	(40)	(40)	(30)						
		P	(37)	(26)	(49)	(40)		(79)	(66)	(89)	(70)	
FEMALES	Course Achievement: Factor Score	Q	.16	.16	.14	.20						
		P	.00	.65	.21	.32	2.75**	.14	.42	.19	.26	1.83
	Multiple Choice Test Score	Q	.24	.04	.22	.19						
		P	.22	.57	.24	.29	1.66	.26	.31	.23	.27	.47
	(N)	Q	(52)	(33)	(41)	(46)						
		P	(35)	(43)	(54)	(69)		(87)	(76)	(95)	(115)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled. *$p < .05$ **$p < .01$

Table 15

Correlations of Previous Grade Point Average and the Essay Test Score in Different Teaching Conditions

			Course A		Course B		Z	Course A	Course B	Z
			L	S	L	S				
TOTAL SAMPLE		Q	.22	.30	.29	.10	1.27			
		P	.23	.40	.20	.36				
	(N)	Q	(94)	(73)	(81)	(76)				
		P	(72)	(69)	(103)	(109)				
MALES		Q	.11	.32	.06	-.12	2.59**	.23	.00	2.46*
		P	.43	.59	.15	.38		.47	.29	
	(N)	Q	(42)	(40)	(40)	(30)		(82)	(70)	
		P	(37)	(26)	(49)	(40)		(63)	(89)	
FEMALES		Q	.35	.27	.50	.20	1.05			
		P	-.01	.30	.24	.29				
	(N)	Q	(52)	(33)	(41)	(46)				
		P	(35)	(43)	(54)	(69)				

Note: -- Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05

**p < .01

In summary, then, two general findings seem salient: (a) neither sex, class in college, nor initial course motivation functioned as an interaction variable in the present study; and (b) first-year grade point average showed some significant interaction effects with the course satisfaction outcome variable and the essay test score for male students, and with the amount of non-graded reading for female students. The most striking of the latter effects is that presented in Table 15, where for male students GPA was more highly correlated with the essay test score in the Paper than in the Quiz conditions.

California Psychological Inventory (CPI)

Forty-nine scales were scored from the CPI, and these are listed in Table 16. The first 18 are the regular CPI scales (11 of which were developed by an "external" or empirical group-discriminative strategy, four by a rational-intuitive strategy, and three as measures of dissimulation and response bias). The next three sets of scales include 11 scales constructed by the factor analytic variant of an "internal" strategy, plus 11 scales constructed by the theoretical, and seven scales constructed by the rational, variants of an "intuitive" strategy; these 29 factor, theoretical, and rational scales are discussed in some detail in Hase and Goldberg (1967). Finally, two factor scales constructed by Nichols and Schnell (1963) were included.

Insert Table 16 about here

As a guard against the possibility of students responding in a quasi-random or careless manner, scores on the Communality (Cm) scale were examined critically. Those 54 students (about 5% of the sample) with raw scores on Cm less than 23 were excluded from the analyses. This conservative cutting score, which eliminated

Table 16

The 49 *A Priori* C.P.I. Scales

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
Dominance (Do)	28	30	29	29	7	6	6	6
Capacity for Status (Cs)	21	21	22	22	4	3	3	4
Sociability (Sy)	26	26	26	26	5	5	5	5
Social Presence (Sp)	38	39	38	38	6	6	6	6
Self-acceptance (Sa)	23	24	23	24	4	3	4	4
Sense of Well-being (Wb)	36	37	36	36	4	4	5	4
Responsibility (Re)	30	29	32	32	5	4	4	4
Socialization (So)	36	37	39	39	5	6	5	5
Self-control (Sc)	26	25	27	27	7	7	7	7
Tolerance (To)	23	23	24	24	5	4	4	4
Good impression (Gi)	15	15	15	15	6	6	6	5
Communality (Cm)	26	26	26	26	1	1	1	1
Achievement via conformance (Ac)	27	27	27	28	5	5	4	4
Achievement via independence (Ai)	22	22	22	22	4	4	3	4
Intellectual efficiency (Ie)	40	40	41	41	5	4	4	4
Psychological-mindedness (Py)	12	11	12	11	3	3	3	3
Flexibility (Fx)	12	12	12	12	4	4	4	4
Femininity (Fe)	16	16	23	23	4	4	3	3
Extraversion-Introversion (fEx)	15	16	16	16	5	5	5	5
Harmonious Childhood (fHa)	5	6	6	6	2	2	2	2
Surgency (fSu)	9	9	9	9	3	3	3	3
Conformity-Rebelliousness (fCo)	8	8	9	9	3	3	3	3
Ascendence-Submission (fAs)	8	8	7	7	4	3	4	3
Neuroticism (fNe)	16	16	16	16	4	4	4	4
Orthodoxy-Flexibility (fOr)	13	13	13	14	4	4	5	4
Self Confidence (fSe)	6	6	5	5	3	3	3	3
Amiability-Irritability (fAm)	9	9	9	9	1	1	1	1
Serenity-Depression (fSe)	15	15	15	15	3	3	3	3
Psychoticism (fPs)	18	18	18	18	3	3	3	2
Need for Achievement (nAc)	12	12	12	12	3	3	3	3
Need for Affiliation (nAf)	7	7	8	8	2	2	2	2
Need for Deference (nDe)	6	6	6	6	2	2	2	2
Need for Dominance (nDo)	9	10	9	9	4	4	4	4
Need for Exhibition (nEx)	7	8	7	7	3	3	3	2
Need for Infravoidance (nIn)	8	7	8	8	5	5	4	5
Need for Nurturance (nNu)	8	8	8	8	2	1	1	1
Need for Order (nOr)	6	7	6	7	3	3	3	3
Need for Play (nPl)	7	7	7	7	2	2	2	2
Need for Understanding (nUn)	8	8	8	8	2	2	2	2
Need for Autonomy (nAu)	7	7	7	7	3	3	3	3
Dominance (Dom)	28	30	27	27	8	7	8	8
Sociability (Soc)	25	26	25	26	7	7	7	7
Responsibility (Res)	21	21	22	22	5	6	5	5
Psychological-Mindedness (Psy)	21	20	21	21	5	4	4	4
Femininity (Fem)	12	12	17	18	3	3	3	3
Academic Achievement (Ach)	25	25	25	25	5	5	5	5
Conformity (Con)	16	16	16	17	4	4	4	4
Value Orientation (NS-I)	69	68	71	70	15	14	13	12
Person Orientation (NS-II)	33	34	33	33	9	8	8	8
(N)	(160)	(166)	(182)	(218)				

all students with Cm T-scores below 40 (based on the normative sample reported in the CPI Manual), should insure that most of the remaining students reponded with some care to the items in this inventory.

The means and standard deviations for the 49 CPI scales are presented in Table 16, separately by course and by sex. The mean scores from students in each of the two courses were virtually identical. Female students achieved higher mean scores than males on such scales as Responsibility and Socialization, as well as on the two Femininity scales. The intercorrelations among the 49 CPI scales are available from the author.

Table 17 summarizes some CPI scale interactions with the course satisfaction factor score. The upper section of the table presents significant interactions in the total sample, the middle section in the male sample, and the bottom section in the female sample. Note that scales which functioned in an interactive role for male students did not reach significance for the females, and vice versa. This finding, which recurred consistently for all inventories and for all criteria, illustrates the potential hazards which may be expected when male and female students are combined for purposes of data analysis.

Insert Table 17 about here

In interpreting the results of Table 17 and those to follow, it is especially important that the reader understand that the tabled interactions represent but a small proportion of the total number of scales analyzed, and consequently that a number of significant interactions may be expected on the basis of chance alone. For example, each of the 49 CPI scales had three opportunities to function in an interactive role (LQ vs. SP, Q vs. P, and L vs. S), for a total of 147 analyses in each of the two samples. The fact that three or

Table 17

Correlations between C.P.I. Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

	CPI Scale		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
TOTAL SAMPLE	nUn	Q	-.03	.08	.00	.00	2.10*	Q	.02		.01		2.53*
		P	.17	.10	.22	.30		P	.13		.27		
	fEx	Q	.08	.09	.06	.12	1.00	Q	.08		.08		2.73**
		P	-.16	-.17	-.33	.10		P	-.18		-.07		
	nAf	Q	.12	.13	.08	-.06	1.95	Q	.13		.01		2.67**
		P	-.16	-.14	-.16	-.07		P	-.16		-.11		
	(N)	Q	(101)	(84)	(86)	(81)		Q	(185)		(167)		
		P	(76)	(81)	(100)	(117)		P	(157)		(217)		
MALES	Fe	Q	-.19	.20	.03	-.07	1.52	Q	-.01		-.03		2.33*
		P	.32	.23	.30	.12		P	.26		.22		
	nUn	Q	-.07	-.07	.15	-.02	1.19	Q	-.07		.09		2.20*
		P	.24	.07	.33	.39		P	.15		.35		
	(N)	Q	(44)	(45)	(41)	(37)		Q	(89)		(78)		
		P	(40)	(31)	(47)	(41)		P	(71)		(88)		
FEMALES	nAf	Q	.02	.40	.03	-.07	1.44	Q	.16		-.02		2.52*
		P	-.22	-.19	-.20	-.16		P	-.21		-.17		
	fEx	Q	-.04	.30	.14	.16	.43	Q	.08		.15		2.43*
		P	-.08	-.21	-.42	.09		P	-.18		-.09		
							(N)	Q	(96)		(89)		
								P	(86)		(129)		
	nIn	Q	.08	-.18	.01	-.12	.90		.09	-.05	.14	-.17	2.21*
		P	.06	.04	.24	-.20							
	Ach	Q	-.08	.16	-.01	.12	2.09*		-.01	.17	-.01	.24	2.11*
		P	.22	.16	-.05	.32							
	(N)	Q	(57)	(39)	(45)	(44)							
		P	(36)	(50)	(53)	(76)			(93)	(89)	(98)	(120)	

Note: -- Values in the table are correlations between CPI scales and the Course Satisfaction Factor Score. Critical comparisons have been circled.

*$p < .05$	L = Lecture Instruction	Q = Quiz Sections
**$p < .01$	S = Self-study Instruction	P = Paper Sections

four scales show significant interaction effects under these conditions, therefore, is hardly surprising. For this reason, the personalogical implications of the significant interaction effects discovered in this project will not be discussed, awaiting a replication of these findings in other settings. Consequently, the reader should view this table, and those to follow, simply as clues as to the personality scales he may wish to include in future investigations.

Table 18 presents the significant interactions between CPI scales and the non-graded reading criterion. The results for the total sample are presented in the upper section of the table and those for the female sample are presented in the lower section; no scales manifested significant interactions in the male sample. One finding deserves brief mention, namely that the theoretically-based Need for Play (nPl) scale was more highly (negatively) related to extracurricular reading in the Self-study (S) than in the Lecture (L) condition. Should this result be replicated, it might suggest that more playful persons be assigned to more structured teaching conditions.

Insert Table 18 about here

Table 19 summarizes the interactions between CPI scales and the course achievement outcome variable. The most significant of these interactions involved the CPI Femininity (Fe) scale in the male sample, where Femininity was related to achievement in the Self-study (S) but not in the Lecture (L) sections.

Insert Table 19 about here

Table 20 summarizes some CPI interactions with the essay test score. Scores on CPI Responsibility scales were positively correlated with the essay test score

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Insert Table 20 about here

Table 18

Correlations between C.P.I. Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	CPI Scale		Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
TOTAL SAMPLE	nPl	Q	.03	-.17	.10	-.37	2.57*	-.02	-.20	-.12	-.27	2.33*
		P	-.09	-.22	-.25	-.19						
	fSu	Q	-.06	-.08	.09	-.36	2.71**	-.13	-.21	-.09	-.25	1.67
		P	-.25	-.36	-.20	-.16						
	nEx	Q	.01	.01	.09	-.24	2.24*	-.06	-.10	-.02	-.16	1.20
		P	-.20	-.26	-.15	-.10						
	(N)	Q	(101)	(84)	(86)	(81)		(177)	(165)	(186)	(198)	
		P	(76)	(81)	(100)	(117)						
FEMALES	Ai	Q	.15	.24	-.13	.12	2.19*	.07	.41	.00	.11	2.35*
		P	-.06	.48	-.03	.11						
	fNe	Q	.14	.06	-.33	.16	2.19*	.14	.24	-.25	.12	2.35*
		P	.18	.30	-.18	.10						
	Psy	Q	.19	.08	-.20	.05	1.91	.05	.30	-.14	.08	2.35*
		P	-.18	.40	-.17	.10						
	To	Q	.10	.06	-.26	.21	2.05*	.09	.24	-.16	.13	2.16*
		P	.08	.30	-.12	.09						
	Ie	Q	.20	.23	-.24	.26	1.58	.10	.31	-.09	.13	2.16*
		P	-.13	.33	-.04	.06						
	fSu	Q	-.06	-.10	.00	-.27	2.63**	-.13	-.30	-.03	-.27	2.11*
		P	-.28	-.48	.03	-.26						
	Re	Q	.06	.19	-.25	.27	1.98*	.08	.22	-.12	.17	2.11*
		P	.11	.24	-.07	.11						
	nNu	Q	.04	.10	-.29	.14	2.45*	.05	.23	-.10	.11	1.91
		P	.05	.33	.10	.08						
	(N)	Q	(57)	(39)	(45)	(44)		(93)	(89)	(98)	(120)	
		P	(36)	(50)	(53)	(76)						

Note: -- Values in the table are correlations with the Non-graded Reading Factor Score. Critical Comparisons have been circled.

*$p < .05$
**$p < .01$

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

Table 19

Correlations between C.P.I. Scales and the Course Achievement Factor Score in Different Teaching Conditions

	CPI Scale		Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
TOTAL SAMPLE	nNu	Q	-.01	.04	-.12	.24						
		P	.04	.09	.16	.21	2.05*	.02	.08	.05	.23	1.60
	(N)	Q	(101)	(84)	(86)	(81)						
		P	(76)	(81)	(100)	(117)		(177)	(165)	(186)	(198)	
MALES	Fe	Q	.06	.40	-.16	.07						
		P	-.19	.37	-.04	.30	2.38*	-.05	.34	-.08	.20	3.01**
	(N)	Q	(44)	(45)	(41)	(37)						
		P	(40)	(31)	(47)	(41)		(84)	(76)	(88)	(78)	
FEMALES	nNu	Q	-.04	-.02	-.30	.19						
		P	-.10	.09	.15	.20	2.30*	-.08	.04	-.04	.18	1.67
	fAs	Q	-.21	.03	-.03	.06						
		P	-.04	.12	-.15	.14	1.80	-.11	.08	-.11	.11	2.01*
	nUn	Q	.05	.22	-.04	.24						
		P	-.12	.25	-.02	.21	1.62	-.01	.24	-.02	.21	2.35*
	(N)	Q	(57)	(39)	(45)	(44)						
		P	(36)	(50)	(53)	(76)		(93)	(89)	(98)	(120)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$

$^{**}p < .01$

Table 20

Correlations between C.P.I. Scales and the Essay Test Score in Different Teaching Conditions

	CPI Scale		Course A L	Course A S	Course B L	Course B S	Z		Course A L	Course A S	Course B L	Course B S	Z
TOTAL SAMPLE	Re	Q	-.01	.24	.02	.14	2.38^{*}		.00	.21	.03	.25	2.93^{**}
		P	.01	.18	.06	.32							
	Res	Q	-.09	.22	-.02	.15	2.38^{*}		-.13	.18	.07	.21	3.00^{**}
		P	-.18	.13	.13	.25							
	fHa	Q	-.01	.28	.10	.15	.48		-.05	.22	-.01	.10	2.53^{*}
		P	-.10	.13	-.09	.06							
	So	Q	-.08	.26	.05	.11	.71		-.10	.19	.03	.09	2.27^{*}
		P	-.12	.05	.02	.07							
	NS-I	Q	.00	.27	.02	.17	.81		-.04	.17	.07	.17	2.07^{*}
		P	-.09	.02	.11	.17							
								(N)	(177)	(165)	(186)	(198)	
	Py	Q	.16	.09	.30	.16	1.81	Q	.14		.25		2.60^{**}
		P	-.07	-.01	.01	.10		P	-.04		.04		
	fNe	Q	.01	.18	.09	.22	.33	Q	.10		.15		2.07^{*}
		P	-.06	-.12	-.05	.15		P	-.09		.02		
	(N)	Q	(101)	(84)	(86)	(81)		Q	(185)		(167)		
		P	(76)	(81)	(100)	(117)		P	(157)		(217)		

Table 20
Page Two

	CPI Scale		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
MALES	Fe	Q	-.12	.30	-.13	.02	3.30^{**}		.01	.34	.02	.25	2.57^{*}
		P	.12	.40	.11	.41							
	Re	Q	-.24	.35	-.11	.22	2.44^{*}		-.08	.32	-.06	.18	2.88^{**}
		P	.04	.28	-.01	.18							
	Res	Q	-.28	.30	-.10	.19	2.32^{*}		-.23	.24	.02	.18	2.79^{**}
		P	-.22	.19	.11	.20							
	Fem	Q	.04	.56	-.12	-.12	1.58		.06	.48	-.08	.01	2.43^{*}
		P	.07	.35	-.05	.08							
	fSu	Q	-.05	-.18	.20	-.10	1.96^{*}		.01	-.18	.11	-.24	2.39^{*}
		P	.09	-.18	.03	-.32							
	fHa	Q	-.13	.42	-.10	.04	1.93		-.15	.37	-.13	.07	3.27^{**}
		P	-.20	.28	-.15	.13							
	NS-I	Q	.03	.45	.02	.05	.62		-.05	.33	.01	.11	2.17^{*}
		P	-.15	.08	.02	.18							
	Sc	Q	.17	.37	-.07	-.02	.48		.00	.27	-.05	.12	1.99^{*}
		P	-.19	.04	-.02	.22							
	(N)	Q	(44)	(45)	(41)	(37)			(84)	(76)	(88)	(78)	
		P	(40)	(31)	(47)	(41)							
FEMALES	Py	Q	.21	.28	.47	.21	2.66^{**}	Q	.22		.32		3.25^{**}
		P	-.23	-.10	-.01	.08		P	-.15		.03		
	fNe	Q	.01	.24	.24	.20	1.04	Q	.10		.19		2.33^{*}
		P	-.23	-.20	-.07	.16		P	-.21		.02		
							(N)	Q	(96)		(89)		
								P	(86)		(129)		
	Sa	Q	.09	.05	.00	.22	1.62		-.04	.16	.02	.26	2.21^{*}
		P	-.26	.25	.03	.27							
	(N)	Q	(57)	(39)	(45)	(44)			(93)	(89)	(98)	(120)	
		P	(36)	(50)	(53)	(76)							

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

$^{*}p < .05$
$^{**}p < .01$

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

in the Self-study, though not in the Lecture, condition. This effect, significant in the total sample, was particularly striking in the male sample. Moreover, for males, CPI Femininity scores were correlated with the essay test in the Self-study, though not in the Lecture, sections. And, the Psychological-Mindedness scale was correlated with the essay test score in the Quiz, though not in the Paper, sections; this effect was particularly strong in the female sample. Once again, however, the reader is cautioned against accepting these findings until they have been replicated in other courses.

Survey of Study Habits and Attitudes (SSHA)

The 1956 revision of Brown and Holtzman's Survey of Study Habits and Attitudes was included in the battery with the expectation that it might provide some significant interactions with the non-graded reading outcome variable. This version of the Survey contained three scales: one for males, one for females, and one composed of items common to both the male and female keys. The Survey was revised in 1966 and six new scales were added. Since all but one of the new scales included a significant proportion of items from the earlier revision, it was possible to score these five new scales, along with the three 1956 scales. Each of these eight SSHA scales was scored by two methods: the regular scoring procedure described in the SSHA manual and a more complex procedure developed by the author. Since the findings using both scoring methods were quite similar, only the results based on the regular scoring method are presented.

Table 21 presents the means, standard deviations, and intercorrelations among the eight SSHA scales. Female students scored almost a half standard deviation

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Insert Table 21 about here

Table 21

Means, Standard Deviations, and Intercorrelations among Eight Scales from the Survey of Study Habits and Attitudes (SSHA)

Scale		F	M	C	DA	WM	EA	SH	SO
Female Key (1956)	F	-	.93	.98	.71	.81	.74	.88	.91
Male Key (1956)	M	.94	-	.95	.81	.80	.78	.91	.95
Common Key (1956)	C	.98	.95	-	.70	.80	.73	.86	.89
Delay Avoidance (1966)	DA	.75	.83	.73	-	.53	.63	.85	.85
Work Methods (1966)	WM	.82	.79	.81	.52	-	.50	.90	.84
Educational Acceptance (1966)	EA	.76	.81	.75	.69	.51	-	.64	.82
Study Habits (DA + WM)	SH	.90	.92	.88	.86	.89	.68	-	.96
Study Orientation (SH + EA)	SO	.92	.96	.90	.86	.82	.85	.97	-

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
F	30	30	34	33	9	9	9	9
M	36	36	41	39	10	11	11	11
C	22	22	25	24	7	7	7	8
DA	18	18	20	19	6	6	6	6
WM	24	24	27	26	8	8	7	8
EA	20	19	21	20	6	5	6	6
SH	43	42	47	46	12	12	11	12
SO	62	62	68	66	16	16	16	17
(N)	(184)	(186)	(194)	(236)				

Note: -- Correlations above the main diagonal are from the total male sample (N = 393), while those below the diagonal are from the total female sample (N = 463). All scales were scored from the 1956 revision of the SSHA.

higher than males on most of these scales. Note that all scales were highly correlated, and even the three independently-keyed 1966 scales appear to be tapping much the same factor.

The SSHA scales were originally constructed to predict academic achievement, and in the present study these scales were positively correlated with the achievement criteria (see Table 10). Unfortunately, there was a large interaction with course, especially for female students. Since the pattern of SSHA correlations with achievement was significantly different in each of the two experimental courses, no replicated interaction effects with the achievment criteria were found.

Table 22 summarizes the significant SSHA interaction effects with the non-graded reading outcome variable. Note that those SSHA scales which produced significant interactions in the male sample did not do so for females, and the one scale which produced a significant interaction in the female sample did not play the same role for males. Table 22 reveals a high correlation between SSHA scales and the non-graded reading outcome variable in the Self-study-Quiz (SQ) section of Course A, and in the Lecture-Paper (LP) section of Course B--a peculiar finding which insured that the Quiz vs. Paper and the Lecture vs. Self-study interaction effects were not significant. Note, moreover, that the general pattern of correlations was reversed between the male and female samples. On the basis of these findings, it seems sensible to recommend that male and female students never be combined in analyses utilizing SSHA scales.

Insert Table 22 about here

Table 22

Correlations of SSHA Scales with the Non-graded Reading Outcome Variable in Different Teaching Conditions

SSHA Scale		Male Students					Female Students				
		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
Male Key	Q	.23	.46	.40	.11	2.32*	-.05	.21	-.04	.21	1.48
	P	.11	-.20	.32	.12		.14	.16	-.05	.15	
DA	Q	.12	.43	.41	.17	2.48*	.03	.05	.09	.18	1.00
	P	.22	-.22	.24	.00		.09	.22	-.08	.17	
SH	Q	.26	.46	.40	.24	2.26*	-.02	.27	.12	.05	.66
	P	.19	-.19	.27	.17		.06	.15	-.09	.13	
SO	Q	.28	.46	.37	.23	2.23*	-.02	.19	-.08	.13	1.55
	P	.19	-.18	.31	.16		.12	.19	-.09	.13	
EA	Q	.25	.35	.21	.14	1.43	-.08	-.01	-.28	.22	2.58**
	P	.14	-.09	.29	.11		.21	.22	-.06	.11	
(N)	Q	(50)	(54)	(45)	(40)		(59)	(40)	(48)	(52)	
	P	(44)	(36)	(55)	(46)		(42)	(53)	(60)	(76)	

Note: -- Values in the table are correlations between SSHA scales and the Non-graded Reading factor score. Critical comparisons have been circled.

L = Lecture Instruction	Q = Quiz Sections
S = Self-study Instruction	P = Paper Sections

*p < .05

**p < .01

Educational Set Scale (ESS)

Of all the inventories utilized in the present project, only Siegel and Siegel's (1965) Educational Set Scale was specifically constructed to be an interaction variable with differing college instructional procedures. While Siegel and Siegel (1964, 1965, 1966) have reported findings based only on the total ESS score, each of the six sub-sections of this inventory were scored in the present project. The means, standard deviations, and intercorrelations among the six sub-scores and the total score are presented in Table 23. Note that, unlike the SSHA, males and females achieved similar mean scores on the Educational Set Scale, and the correlations among sub-scores--while positive--were quite low.

Insert Table 23 about here

The Educational Set Scale was specifically constructed to interact with course achievement, and the results for this criterion are presented in Table 24.

Insert Table 24 about here

Note that ESS total score did not produce a significant interaction effect in either sample, and that of 18 analyses involving the sub-scores only two were statistically significant. The one significant interaction in the male sample bore no resemblance to that in the female sample. Moreover, there were no significant interaction effects between ESS scores and any of the other criterion variables.

Strong Vocational Interest Blank (SVIB)

The SVIB form which was administered to the students in this project was an intermediate one, which had been developed by Campbell and his associates

Table 23

Means, Standard Deviations, and Intercorrelations among the Sections of the Educational Set Scale (ESS)

	Geog.	S.S.	B.E.	Gov.	N.S.	Eng.	Total Score
Geography	-	.36	.30	.37	.30	.26	.69
Social Science	.28	-	.21	.29	.20	.25	.60
Business Economics	.31	.22	-	.33	.35	.30	.64
Government	.37	.29	.26	-	.24	.40	.72
Natural Science	.31	.12	.28	.21	-	.23	.57
English	.36	.23	.20	.34	.18	-	.62
Total Score	.70	.57	.60	.69	.55	.61	-

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
Geography	6	6	6	5	2	2	2	2
Social Science	5	5	6	5	2	2	2	2
Business Economics	5	5	5	5	2	2	2	2
Government	6	6	7	7	3	3	2	2
Natural Science	4	4	4	4	2	2	2	2
English	5	5	5	5	2	2	2	2
Total Score	31	30	32	31	8	8	7	8
(N)	(170)	(166)	(185)	(223)				

Note: -- Correlations above the main diagonal are from the total male sample (N = 350), while those below the diagonal are from the total female sample (N = 432). Note that the correlations involving the ESS Total Score are part-whole correlations.

Table 24

Correlations of the Educational Set Scale with the Course Achievement Outcome Variable in Different Teaching Conditions

		Total Sample					Male Sample					Female Sample				
		Course A		Course B		Z	Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S		L	S	L	S	
Geography	Q	.08	.17	.02	.27		-.11	-.01	-.06	.26		.22	.45	.09	.29	
	P	.10	.26	.22	.14	1.49	.21	.39	.21	.10	2.05*	-.04	.22	.26	.17	.29
Social Science	Q	-.05	.29	-.01	.23		-.17	.32	-.03	.26		.00	.25	.06	.21	
	P	.26	.24	.25	.11	1.97*	.54	.17	.13	.07	1.33	-.10	.26	.35	.20	1.49
Business Economics	Q	.11	.24	-.11	.26		-.10	.13	.10	.37		.25	.42	-.27	.19	
	P	.19	.24	.29	.15	1.88	-.08	.21	.16	.05	.78	.45	.27	.37	.20	1.85
Government	Q	.18	.29	.19	.17		.18	.38	.10	.17		.15	.18	.25	.17	
	P	.15	.22	.31	.32	.87	.13	.12	.17	.07	.27	.17	.27	.42	.41	1.12
Natural Science	Q	.12	.26	.20	.13		-.17	.24	.23	.29		.29	.29	.15	.01	
	P	.32	.19	.10	.13	.00	.28	.04	-.04	.12	.30	.37	.30	.21	.13	.04
English	Q	.21	.23	.12	.39		.12	.14	.07	.38		.24	.39	.15	.39	
	P	.08	.00	.34	.16	.82	.24	.07	.26	.13	.03	-.13	-.04	.39	.12	1.12
Total Score	Q	.16	.41	.11	.36		-.04	.34	.10	.41		.31	.53	.13	.33	
	P	.29	.32	.38	.27	1.63	.36	.29	.22	.14	1.14	.19	.34	.51	.33	.87
(N)	Q	(103)	(87)	(86)	(88)		(45)	(50)	(38)	(38)		(58)	(37)	(48)	(50)	
	P	(78)	(87)	(105)	(110)		(40)	(35)	(49)	(41)		(38)	(52)	(56)	(69)	

Note: -- Values in the table are correlations with the Course Achievement factor score. Critical comparisons have been circled. *$p < .05$

prior to the latest revision of the inventory. Both male and female students were administered the same (male) form. In 1968, the original protocols were re-scored on the most recent set of SVIB scales. The means and standard deviations for each of these 100 scales are listed in Table 25. The intercorrelations among the SVIB scales are available from the author.

Insert Table 25 about here

The first 22 scales listed in Table 25 are the new Basic Interest Scales (Campbell, Borgen, Eastes, Johansson, & Peterson, 1968). These rationally-devised, content-homogeneous, short scales have been proposed as relatively pure measures of interest in various occupational activities. Mean scores for male and female students revealed the expected pattern of sex differences: males achieved higher scores on such scales as Mechanical, Technical Supervision, Law-Politics, Military, Mathematics, Science, Adventure, and Recreational Leadership, while females scored higher on such scales as Art, Writing, Music, Social Service, and Nature. Sixty-three occupational ("empirical") scales were scored, including some revised and new ones. As expected, male students scored higher on such occupational scales as Production Manager, Army Officer, Air Force Officer, and Computer Programmer, while females scored higher on a number of social service and artistic scales (e.g., Social Worker, Social Science Teacher, School Superintendent, Priest, Minister, Librarian, Interior Decorator, Music Performer, Music Teacher, Advertising Man, Photographer, Journalist, Author-Journalist, and Sociologist). Finally, a set of special scales were scored, including those developed to measure Academic Achievement, Masculinity-Femininity, Occupational Level, Specialization Level, Introversion-Extroversion, Liberalism-Conservatism, and Diversity of Interests. Once again, the expected male-female differences

Table 25

Means and Standard Deviations of the S.V.I.B. Scales

	Means				Standard Deviations			
	Males		Females		Males		Females	
Basic Interest Scales (Set 1; +1, 0, -1 weights; standard scores)	A	B	A	B	A	B	A	B
1. Public Speaking	53	55	51	53	10	10	10	10
2. Law-Politics	55	56	50	50	10	10	10	10
3. Business Management	49	51	47	48	11	10	11	10
4. Sales	49	50	47	46	9	8	7	7
5. Merchandising	50	52	53	53	11	10	11	9
6. Office Practices	48	49	52	52	11	10	13	12
7. Military	47	48	43	43	9	10	6	7
8. Technical Supervision	46	44	36	35	11	10	9	9
9. Mathematics	48	46	43	42	12	12	12	12
10. Science	49	47	45	44	11	11	11	10
11. Mechanical	45	42	35	34	11	10	9	8
12. Nature	44	43	49	49	9	9	9	9
13. Agriculture	46	44	46	46	10	10	11	10
14. Adventure	56	56	51	50	10	10	10	9
15. Recreational Leadership	50	49	43	44	10	9	9	8
16. Medical Service	55	53	53	54	11	11	11	11
17. Social Service	55	55	62	64	10	10	10	9
18. Religious Activities	52	51	53	56	12	11	12	12
19. Teaching	54	53	57	57	9	9	10	9
20. Music	52	49	56	55	10	10	10	10
21. Art	53	53	64	64	10	10	7	7
22. Writing	54	54	60	59	10	9	8	8
Occupational Scales								
23. Dentist	27	24	26	26	12	10	10	9
24. Physical Therapist	35	33	32	32	12	12	12	10
25. Optometrist	38	37	32	31	12	11	12	10
26. Osteopath	28	25	27	27	11	11	10	11
27. Veterinarian	26	25	21	21	12	11	10	10
28. Physician	31	27	31	29	15	14	13	13
29. Psychiatrist	31	27	33	32	12	13	12	11
30. Sociologist	32	31	40	39	11	11	9	9
31. Anthropologist	29	27	35	33	12	11	11	10
32. Political Scientist	27	27	35	34	11	11	9	9
33. Economist	31	30	34	32	10	10	8	8
34. Psychologist	31	28	33	30	11	11	10	10
35. Biologist	27	23	27	25	15	14	12	12
36. Architect	26	24	29	27	12	12	12	10
37. Mathematician	21	18	23	21	12	11	11	9
38. Physicist	19	15	16	13	15	13	12	10
39. Chemist	26	21	20	17	17	15	13	13
40. Engineer	22	20	15	14	13	12	10	10
41. Production Manager	28	28	18	19	10	10	8	8
42. Army Officer	24	24	12	11	13	12	12	11
43. Air Force Officer	30	29	19	19	11	10	9	8

Table 25
Page Two

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
44. Carpenter	18	16	11	10	13	11	10	10
45. Forest Service Man	18	17	10	11	13	13	11	11
46. Farmer	28	28	23	23	10	9	8	9
47. Math-Science Teacher	29	26	23	22	11	11	9	9
48. Computer Programmer	34	31	24	22	13	12	12	11
49. Printer	28	28	27	26	9	9	9	9
50. Policeman	19	19	14	16	10	10	9	8
51. Personnel Director	26	28	24	26	14	12	11	11
52. Public Administrator	34	35	32	32	13	11	11	11
53. Rehabilitation Counselor	33	34	38	38	11	10	10	10
54. YMCA Secretary	33	35	36	38	13	12	12	10
55. Community Rec. Administrator	31	33	33	34	13	12	13	11
56. Elementary Teacher	41	40	44	43	11	10	10	10
57. Social Worker	32	33	39	40	14	12	12	11
58. Social Science Teacher	31	35	39	42	14	13	11	10
59. School Superintendent	23	25	30	32	12	11	10	10
60. Priest	38	39	48	49	11	10	9	9
61. Minister	21	19	34	36	15	14	11	12
62. Librarian	32	32	46	46	12	12	9	9
63. Interior Decorator	31	32	44	44	10	9	9	8
64. Artist	30	28	34	33	11	10	10	9
65. Music Performer	38	37	48	48	12	11	10	10
66. Music Teacher	31	32	44	45	13	11	10	10
67. Certified Public Accountant	29	32	23	22	14	13	11	11
68. Credit Manager	31	34	29	30	14	12	12	11
69. Chamber of Commerce Officer	37	39	39	40	12	10	10	9
70. Business Education Teacher	31	33	33	34	12	11	11	10
71. Accountant	21	22	19	20	13	12	12	12
72. Office Worker	27	31	29	31	13	12	13	11
73. Purchasing Agent	28	30	22	23	11	12	9	10
74. Banker	22	25	22	24	10	11	10	10
75. Pharmacist	27	27	27	28	10	10	9	9
76. Mortician	29	31	34	35	9	10	9	9
77. Sales Manager	29	33	29	30	13	12	10	9
78. Real Estate Salesman	36	39	37	38	9	10	8	8
79. Life Insurance Salesman	31	34	36	37	11	11	10	9
80. Advertising Man	32	35	41	41	11	11	10	10
81. Lawyer	33	34	35	36	9	9	7	8
82. Photographer	31	29	38	36	11	12	11	11
83. Journalist	33	34	43	43	13	12	10	11
84. Author-Journalist	34	34	41	41	9	8	8	8
85. Pres. Manufacturing Concern	22	25	21	20	11	10	9	9

Table 25
Page Three

Special Scales	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
86. Academic Achievement	48	44	54	53	12	13	10	10
87. Masculinity-Femininity (1967)	53	55	36	37	12	12	9	10
88. Occupational Level	58	59	60	61	8	8	6	6
89. Specialization Level	43	41	43	41	9	10	9	9
90. Introversion-Extroversion	45	42	43	42	12	10	11	10
91. Liberalism-Conservatism	52	52	62	62	11	9	8	8
92. Diversity of Interests	56	56	56	58	10	10	9	9
93. Managerial Effectiveness	39	42	37	35	10	11	9	9
94. Age Related	40	39	44	43	9	10	10	9
95. Experimental Check*	40	40	40	40	0	0	0	0
96. Unpopular Responses*	1	1	1	1	2	1	1	1
97. Form Check *	0	0	1	1	3	3	3	3
98. Total "L" (first 100 items)	33	31	35	34	13	13	13	12
99. Total "I" (first 100 items)	29	31	22	23	13	14	12	12
100. Total "D" (first 100 items)	37	38	43	43	16	16	16	16
(N)	(179)	(177)	(187)	(227)				

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*Proposed only as measures of response and scoring "validity."

appeared: males scored almost two standard deviations higher than females on the Masculinity-Femininity scale, and females scored higher than males on Liberalism-Conservatism and Academic Achievement.

Table 26 presents the significant SVIB interactions for female students with the course satisfaction outcome variable. There were no significant interaction effects with this criterion for male students. When one considers the fact that nearly 100 SVIB scales were analyzed in the present project, those few scales which manifested significant interactions must be viewed with considerable skepticism. Again, as with the CPI, these results are presented solely to guide future replications and extensions of the present investigation.

Insert Table 26 about here

Table 27 presents the significant interactions between SVIB scales and the non-graded reading outcome variable. The upper section of Table 27 presents the interactions for the male sample, while the lower section presents the interactions for the female sample. Interestingly, females with interests like military personnel (e.g., Army Officer, Air Force Officer) tended to do more than average reading in the Lecture sections and to do less than average reading in the Self-study sections.

Insert Table 27 about here

Table 28 summarizes the interactions of SVIB scales with the course achievement outcome variable. Among female students, scores on the Nature and Agriculture scales correlated positively with achievement in the Self-study, and negatively in the Lecture, sections.

Insert Table 28 about here

Table 26

Correlations between SVIB Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

(Female Students Only)

Basic Interest Scales		Course A L	Course A S	Course B L	Course B S	Z		Course A L	Course A S	Course B L	Course B S	Z
Social	Q	.28	.31	.26	-.14	2.45*	Q	.29		.05		1.69
Service	P	-.14	-.01	.28	-.10		P	-.05		.06		
Law-	Q	-.08	.04	-.06	.27	1.68	Q	-.03		.11		2.79**
Politics	P	-.18	-.45	-.08	-.12		P	-.36		-.10		
Occupational Scales												
Social Sci.	Q	.18	.02	.15	-.25	2.52*	Q	.11		-.08		1.24
Teacher	P	-.13	-.07	.09	-.28		P	-.07		-.15		
Chemist	Q	-.07	.01	-.15	.13	2.19*	Q	-.03		.02		1.34
	P	.11	.12	.00	.25		P	.10		.16		
Psychologist	Q	.13	.01	-.14	.13	2.01*	Q	.09		.01		1.54
	P	.09	.27	.18	.25		P	.19		.22		
Artist	Q	.02	-.27	.06	.02	1.42	Q	-.10		.05		2.69**
	P	.29	.21	.18	.25		P	.26		.22		
Architect	Q	.00	-.25	.02	-.02	1.72	Q	-.10		.02		2.49*
	P	.27	.20	.02	.28		P	.24		.18		
Dentist	Q	-.06	-.15	.05	-.14	1.20	Q	-.10		-.05		2.34*
	P	.18	.04	.12	.27		P	.11		.21		
Rehab.	Q	.20	.25	.07	.22	1.82	Q	.22		.13		2.24*
Counselor	P	.01	-.04	.11	-.19		P	-.02		-.08		
						(N)	Q	(96)		(99)		
							P	(91)		(128)		
Printer	Q	.00	-.30	.33	-.08	1.72		.09	-.07	.27	-.13	2.84**
	P	.18	.06	.21	-.19							
Music	Q	.20	-.18	.18	-.07	.95		.19	-.03	.25	.01	2.34*
Teacher	P	.16	.07	.30	.05							
(N)	Q	(59)	(37)	(48)	(51)			(97)	(90)	(106)	(121)	
	P	(38)	(53)	(58)	(70)							

Note: -- See footnotes on previous tables.

Table 27

Correlations between SVIB Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	SVIB Scale		Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
MALES	Nature	Q	.45	.02	.16	.03	1.89	.28	-.08	.19	.04	2.41*
		P	.05	-.05	.24	.08						
	Agri-culture	Q	.27	-.11	.06	-.16	1.98*	.15	-.17	-.01	-.10	1.90
		P	-.03	-.29	-.05	.00						
	Forest Serv. Man	Q	.28	-.07	.02	.04	2.17*	.16	-.11	-.04	-.09	1.48
		P	-.02	-.19	-.09	-.20						
	(N)	Q	(48)	(52)	(41)	(40)		(90)	(89)	(96)	(81)	
		P	(42)	(37)	(55)	(41)						
FEMALES	Military	Q	.20	-.18	.20	-.16	2.19*	.15	-.20	.23	-.10	3.38**
		P	.11	-.17	.22	-.03						
	Army Officer	Q	.28	-.25	.02	-.10	2.15*	.22	-.18	.03	-.09	2.59**
		P	.10	-.19	.01	-.09						
	Air Force Officer	Q	.29	-.08	.06	-.07	1.75	.24	-.05	.10	-.08	2.34*
		P	.13	-.03	.12	-.09						
	Librar-ian	Q	-.15	.10	-.02	.25	2.23*	-.14	.17	.02	.23	2.59**
		P	-.12	.22	.00	.22						
	Liberal-Conserv.	Q	-.11	.15	-.06	.22	1.24	-.08	.14	-.05	.15	2.09*
		P	-.03	.08	-.04	.09						
	(N)	Q	(59)	(37)	(48)	(51)		(97)	(90)	(106)	(121)	
		P	(38)	(53)	(58)	(70)						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 28

Correlations between SVIB Scales and the Course Achievement Factor Score in Different Teaching Conditions

	Occupational Scale		Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
MALES	Policeman	Q	-.20	-.41	.07	-.38	1.67	-.17	-.40	-.06	-.32	2.41*
		P	-.36	-.41	-.15	-.23						
	(N)	Q	(48)	(52)	(41)	(40)		(90)	(89)	(96)	(81)	
		P	(42)	(37)	(55)	(41)						
FEMALES	Basic Interest Scales											
	Nature	Q	-.11	.21	-.17	.23	3.03**	-.10	.24	-.06	.23	3.13**
		P	.13	.26	-.03	.27						
	Agriculture	Q	-.28	.27	-.27	-.01	2.59**	-.28	.18	-.18	.00	3.23**
		P	-.05	.12	-.14	.02						
	Mechanical	Q	-.11	.20	-.22	-.13	1.50	-.09	.12	-.30	.07	2.94**
		P	.08	.08	-.38	.00						
	Religious	Q	-.16	.13	-.19	.25	1.69	-.13	.09	-.08	.11	2.04*
		P	.04	.08	-.06	.03						
	Occupational Scales											
	Forest Serv. Man	Q	-.11	.07	-.31	-.07	1.79	-.17	.04	-.35	-.02	2.79**
		P	-.03	.02	-.38	.04						
	Physical Therapist	Q	-.18	.21	-.30	-.06	1.86	-.16	.11	-.30	-.05	2.64**
		P	-.06	.05	-.35	-.03						
	Veterinarian	Q	-.30	.14	-.12	-.33	1.35	-.30	.06	-.30	-.18	2.49*
		P	-.17	.01	-.40	-.07						
	Math-Sci. Teacher	Q	-.19	.17	-.16	-.04	1.42	-.06	.05	-.36	.00	2.44*
		P	.17	-.03	-.51	.07						
	Elementary Teacher	Q	.01	.24	.05	.27	.77	-.04	.19	-.04	.16	2.14*
		P	-.10	.16	-.11	.11						
	(N)	Q	(59)	(37)	(48)	(51)		(97)	(90)	(106)	(121)	
		P	(38)	(53)	(58)	(70)						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

*$p < .05$
**$p < .01$

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

In general, interaction effects involving the multiple-choice test score were very similar to those of the course achievement factor score, and consequently the former are seldom tabled in this report. Occasionally, however, the two sets of results differed enough so that separate tabular presentation seems appropriate. Such is the case for SVIB scales in the female sample, and these interactions are presented in Table 29. The Nature scale correlated positively with test scores in the Self-study, though not in the Lecture, sections. Moreover, the Sales Manager scale correlated negatively with multiple-choice test scores in the Self-study, though not in the Lecture, sections. Again, however, these findings demand replication before they can be accepted.

Insert Table 29 about here

Finally, the few significant SVIB interactions associated with the essay test score are presented in Table 30. The small number of these effects, relative to the large number of scales analyzed, makes these few interactions appear rather unremarkable.

Insert Table 30 about here

Edwards Personal Preference Schedule (EPPS)

The means and standard deviations of the 15 regular scales from the EPPS are presented in Table 31, and the intercorrelations among them are available from the author. As expected, male students scored higher than females on Dominance, Aggression, Heterosexuality, and Achievement, while females scored higher than

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Insert Table 31 about here

Table 29

Correlations between SVIB Scales and the Multiple-choice Test Score in Different Teaching Conditions

(Female Students Only)

Basic Interest Scales		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Nature	Q	-.03	.21	-.11	.31	2.26*		-.08	.23	.01	.26	2.84**
	P	-.02	.25	.08	.22							
Agriculture	Q	-.21	.21	-.18	.16	1.53		-.20	.13	-.10	.05	2.39*
	P	-.03	.07	-.05	-.04							
Music	Q	.02	.09	-.29	.13	2.96**		.11	.22	-.12	.20	2.14*
	P	.26	.29	-.01	.23							
							Q	.03		-.06		2.14*
							P	.28		.11		
Occupational Scales												
Sales Manager	Q	-.08	-.43	.14	-.22	2.30*		-.10	-.37	.09	-.22	2.99**
	P	-.18	-.35	.06	-.20							
Life Ins. Salesman	Q	.04	-.24	.20	-.04	2.37*		-.08	-.27	.21	-.09	2.49*
	P	-.35	-.29	.23	-.11							
Purchasing Agent	Q	-.25	-.31	-.05	-.42	1.93		-.20	-.43	-.16	-.32	2.14*
	P	-.19	-.51	-.23	-.27							
Osteopath	Q	-.09	.21	-.07	.00	1.82		-.11	.25	-.11	.03	2.54*
	P	-.08	.29	-.14	.04							
							(N)	(97)	(90)	(106)	(121)	
Architect	Q	.01	-.02	.18	-.14	1.50	Q	-.01		-.02		2.84**
	P	.31	.43	.17	.14		P	.39		.13		
Soc. Sci. Teacher	Q	-.34	-.45	-.07	.26	2.45*	Q	-.05		.11		2.74**
	P	-.07	.32	-.11	-.08		P	-.40		-.07		
(N)	Q	(59)	(37)	(48)	(51)		Q	(96)		(99)		
	P	(38)	(53)	(58)	(70)		P	(91)		(128)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 30

Correlations between SVIB Scales and the Essay Test Score in Different Teaching Conditions

	SVIB Scale		Course A		Course B		Z		Course A	Course B	Z
			L	S	L	S					
MALES	Psychologist	Q	.08	.12	.29	-.13	.87	Q	.08	.06	2.17*
		P	.28	.30	.26	.34		P	.29	.30	
	(N)	Q	(48)	(52)	(41)	(40)		Q	(100)	(81)	
		P	(42)	(37)	(55)	(41)		P	(79)	(96)	
FEMALES	Medical Science	Q	-.22	.15	.15	-.07	2.26*	Q	-.08	.06	2.29*
		P	.19	.37	.11	.16		P	.30	.13	
	Nature	Q	.01	.05	-.05	.07	1.97*		.02	.00	1.34
		P	.11	.31	-.07	.18			.22	.07	
	(N)	Q	(59)	(37)	(48)	(51)		Q	(96)	(99)	
		P	(38)	(53)	(58)	(70)		P	(91)	(128)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$

Table 31

Means and Standard Deviations of the Scales from the EPPS

EPPS Scale	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	*B*	*A*	*B*	*A*	*B*	*A*	*B*
Achievement (*Ach*)	17	16	15	14	4	4	4	4
Deference (*Def*)	11	11	11	11	3	4	4	4
Order (*Ord*)	10	10	9	9	5	4	5	4
Exhibition (*Exh*)	15	15	15	15	4	4	4	4
Autonomy (*Aut*)	15	15	14	14	4	4	5	5
Affiliation (*Aff*)	15	14	17	17	4	4	4	4
Intraception (*Int*)	15	15	17	17	5	5	4	5
Succorance (*Suc*)	11	11	13	13	5	5	5	4
Dominance (*Dom*)	16	17	13	14	5	5	5	5
Abasement (*Aba*)	13	12	14	14	5	5	5	5
Nurturance (*Nur*)	13	12	16	16	5	4	5	5
Change (*Chg*)	16	16	19	18	4	4	4	5
Endurance (*End*)	13	13	12	12	5	5	4	4
Heterosexuality (*Het*)	17	18	15	15	6	5	5	5
Aggression (*Agg*)	13	13	10	11	5	4	4	4
(N)	(165)	(172)	(181)	(222)				

males on such scales as Nurturance, Succorance, Change, Intraception, and Affiliation. As with all other inventories, the means were remarkably similar for students in the two courses.

A few significant interactions between EPPS scales and the course satisfaction outcome variable are presented in Table 32. These interactions stem from negative correlations between EPPS scales and satisfaction in the Lecture-Paper (LP) sections of both courses.

Insert Table 32 about here

Significant EPPS interactions with the non-graded reading outcome variable are summarized in Table 33. For females, scores on Endurance were more highly correlated with extracurricular reading in the Self-study, than in the Lecture, sections.

Insert Table 33 about here

A few interactions involving EPPS scales and the course achievement outcome variable are presented in Table 34. Among male students, the EPPS Achievement scale was positively related to course achievement in the Self-study, but not in the Lecture, condition. Among female students, EPPS Affiliation scores were negatively correlated with achievement in the Quiz sections and positively correlated in the Paper sections.

Insert Table 34 about here

Finally, the significant interactions involving EPPS scales and the essay test score are presented in Table 35. As with the course achievement factor

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Insert Table 35 about here

Table 32

Correlations between EPPS Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

(Female Students Only)

EPPS Scale		Course A L	Course A S	Course B L	Course B S	Z		Course A L	Course A S	Course B L	Course B S	Z
Exhibition	Q	.07	.33	.00	.27	.32	Q	.18		.15		2.94**
	P	-.25	-.07	-.33	.05		P	-.16		-.11		
Aggression	Q	.05	-.25	-.25	.39	1.12	Q	-.06		.10		2.45*
	P	-.33	-.25	-.09	-.25		P	-.28		-.17		
						(N)	Q	(92)		(97)		
							P	(89)		(125)		
Dominance	Q	-.14	.05	-.17	.12							
	P	-.41	-.13	-.32	-.07	.40		-.28	-.06	-.24	-.01	2.25*
(N)	Q	(55)	(37)	(48)	(49)							
	P	(38)	(51)	(55)	(70)			(93)	(88)	(103)	(119)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$
$^{**}p < .01$

Table 33

Correlations between EPPS Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	EPPS Scale		Course A L	Course A S	Course B L	Course B S	Z		Course A L	Course A S	Course B L	Course B S	Z
MALES	Abasement	Q	-.37	-.29	-.21	.07		Q	-.34		-.08		
		P	.22	-.34	.24	-.11	.43	P	-.04		.08		2.10*
							(N)	Q	(96)		(81)		
								P	(69)		(91)		
	Intra-ception	Q	.26	.00	.05	-.19							
		P	.21	-.22	.15	.11	1.31		.23	-.10	.11	-.05	2.21*
	(N)	Q	(48)	(48)	(42)	(39)							
		P	(37)	(32)	(47)	(44)			(85)	(80)	(89)	(83)	
FEMALES	Endurance	Q	-.02	.09	-.13	.26							
		P	.20	.21	-.06	.31	2.45*		.06	.17	-.12	.28	2.55*
							(N)		(93)	(88)	(103)	(119)	
	Autonomy	Q	.17	.20	.03	.13		Q	.18		.07		
		P	-.28	-.08	-.07	-.11	1.40	P	-.15		-.10		2.45*
	Hetero-sexuality	Q	-.05	.37	.25	.02		Q	.13		.16		
		P	-.17	-.09	-.09	.03	.97	P	-.14		-.04		2.30*
	(N)	Q	(55}	(37)	(48)	(49)		Q	(92)		(97)		
		P	(38)	(51)	(55)	(70)		P	(89)		(125)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*$p < .05$

Table 34

Correlations between EPPS Scales and the Course Achievement Outcome Variable in Different Teaching Conditions

	EPPS Scale		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
MALES	Achievement	Q	.04	.37	.05	.29	1.38		.01	.37	.04	.19	2.39*
		P	.04	.45	.01	.06							
	(N)	Q	(48)	(48)	(42)	(39)			(85)	(80)	(89)	(83)	
		P	(37)	(32)	(47)	(44)							
FEMALES	Affiliation	Q	.02	-.34	-.21	-.27	1.19	Q	-.13		-.21		2.94**
		P	.14	.10	.28	.04		P	.10		.16		
								(N) Q	(92)		(97)		
								P	(89)		(125)		
	Aggression	Q	-.14	.20	-.05	.29	.18		-.13	.04	-.18	.06	2.01*
		P	-.20	-.04	-.23	-.10							
	(N)	Q	(55)	(37)	(48)	(49)			(93)	(88)	(103)	(119)	
		P	(38)	(51)	(55)	(70)							

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*$p < .05$
**$p < .01$

Table 35

Correlations between EPPS Scales and the Essay Test Score in Different Teaching Conditions

	EPPS Scale		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
MALES	Endurance	Q	-.04	.07	-.01	.27	1.44		-.13	.14	-.06	.22	2.48*
		P	-.26	.27	-.07	.14							
	Exhibition	Q	-.13	-.07	-.07	-.31	1.16		.01	-.13	.04	-.31	2.25*
		P	.21	-.26	.12	-.30							
								(N)	(85)	(80)	(89)	(83)	
	Deference	Q	.09	-.03	.23	.18	1.35	Q	.02		.21		2.19*
		P	-.31	-.19	-.08	.07		P	-.26		.01		
	(N)	Q	(48)	(48)	(42)	(39)		Q	(96)		(81)		
		P	(37)	(32)	(47)	(44)		P	(69)		(91)		
FEMALES	Nurturance	Q	-.17	.09	-.34	-.26	2.05*	Q	-.08		-.26		2.35*
		P	.00	.04	.20	.01		P	.03		.10		
	Affiliation	Q	-.31	-.18	-.07	-.24	1.87	Q	-.25		-.12		3.38**
		P	.14	.13	.34	.01		P	.14		.17		
	(N)	Q	(55)	(37)	(48)	(49)		Q	(92)		(97)		
		P	(38)	(51)	(55)	(70)		P	(89)		(125)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

score, female students showed a negative correlation between the EPPS Affiliation scale and the essay test score in the Quiz sections, and a positive correlation in the Paper sections.

Adjective Check List (ACL)

Gough's 300-item Adjective Check List was administered using a True-False response format, instead of the typical instructions to check only those adjectives which are self-descriptive. This difference in administration procedure is reflected in the mean scores for the total number of adjectives endorsed. Table 36 presents these means and standard deviations, along with those for each of 25 ACL scales (the first eight of which were constructed by Gough and the next 17 by Heilbrun). For the normative sample reported in the ACL Manual, the mean number of adjectives endorsed was 99 for males and 91 for females; the corresponding means in the present sample were around 150 (half of the number of adjectives in the total item pool). Moreover, the standard deviations of these total scores in the present sample (around 22) were considerably smaller than those in the normative sample (around 35). Since the total number of adjectives endorsed has typically been viewed as a response bias which limits the interpretive value of other ACL scores, the present True-False administration procedure--which serves to increase the mean endorsement rate and to decrease individual differences in endorsement frequency--appears to be a desirable one.

Insert Table 36 about here

Because of the potential problems arising from individual differences in the total number of adjectives endorsed, ACL raw scores are typically converted to T-scores by consulting one of eight conversion tables (four for males and four

Table 36

Means and Standard Deviations of the ACL Scales, Plus their Correlations with Number of Adjectives Checked and with the Residual Scores

ACL Scale	Means				Standard Deviations				Correlations with:			
									No. Checked		Residual Scores	
	Males		Females		Males		Females		Males	Females	Males	Females
	A	B	A	B	A	B	A	B				
Defensiveness-M	23	23	22	23	4	4	4	4	.31	.36	.95	.93
Defensiveness-F	30	30	30	30	5	5	5	5	.08	.09	1.00	1.00
Favorable Adjectives	61	61	60	61	10	9	9	10	.40	.41	.92	.91
Unfavorable Adjectives	17	16	15	16	10	11	9	10	.60	.54	.80	.84
Self-Confidence	24	24	23	23	6	5	6	6	.41	.43	.91	.90
Self-Control	28	28	28	28	5	6	6	6	-.27	-.29	.96	.96
Lability	21	20	21	21	4	4	4	4	.32	.37	.95	.93
Personal Adjustment	26	27	27	28	5	4	4	5	-.15	-.13	.99	.99
Achievement	28	28	27	27	6	6	6	6	.28	.31	.96	.95
Dominance	37	38	36	35	9	8	9	9	.23	.27	.97	.96
Endurance	32	32	31	32	7	8	7	7	.06	.03	1.00	1.00
Order	28	28	26	27	7	7	7	7	.18	.11	.98	.99
Intraception	24	24	24	24	3	3	3	4	.11	.08	.99	1.00
Nurturance	50	50	53	52	9	9	7	8	-.28	-.23	.96	.97
Affiliation	27	27	27	28	5	5	5	5	.33	.37	.94	.93
Heterosexuality	19	20	20	20	4	4	4	4	.25	.28	.97	.96
Exhibition	24	24	23	22	8	7	8	8	.32	.34	.95	.94
Autonomy	20	20	19	18	6	6	6	6	.39	.43	.92	.90
Aggression	24	25	24	23	9	9	9	9	.33	.30	.94	.96
Change	20	21	21	21	4	4	5	4	.21	.30	.98	.95
Succorance	10	9	11	11	4	4	4	4	.22	.13	.98	.99
Abasement	21	20	22	23	7	6	7	7	-.16	-.20	.99	.98
Deference	28	27	28	29	7	6	7	7	-.33	-.38	.94	.93
Counseling Readiness-M	19	18	19	20	7	7	7	7	-.22	-.28	.98	.96
Counseling Readiness-F	16	16	15	15	4	4	3	4	.53	.55	.85	.83
No. Adjectives Checked	153	150	147	152	21	24	19	23	1.00	1.00		
(N)	(179)	(184)	(189)	(236)					(383)	(460)		

Note: -- The ACL was administered using a True-False response format. All ACL scales were scored by assigning unit weights for True responses to "indicative" and for False responses to "contraindictive" adjectives. Since these +1, 0 weights differ from the +1, 0, -1 weights suggested in the ACL Manual, the mean scores presented in this table are not comparable with those based upon the regular ACL scoring procedure. Comparable means can be calculated simply by subtracting the number of "contraindictive" adjectives on each scale from the tabled means. The standard deviations for both scoring procedures are identical, and the correlations between scores based upon the two weighting schemes are unity.

for females), each table based upon a different range of total endorsement frequency. This laborious scoring practice provides only a rough approximation to a more exact procedure, namely converting raw scores to residual scores (with total endorsement partialled out). This latter procedure was used in the present project.

For each of the 25 ACL scores listed in Table 36, residual scores were computed separately in the total male and the total female samples. For readers unfamiliar with residual scores, the residual score for a subject on ACL scale X is equal to the subject's standard score on that scale (Z_x), minus the product of his standard score on the total number of adjectives endorsed (Z_t) and the correlation between scale X and these total scores ($r_{x \cdot t}$). These residual scores, expressed in standard score form, are uncorrelated with the total number of adjectives endorsed. The correlations for each of the ACL raw scores with their corresponding residual scores and with the total number of adjectives endorsed are presented in Table 36. Note that, using the present True-False response format, the correlations between ACL raw scores and total endorsement were quite low (especially for Heilbrun's need scales), and consequently the correlations between raw and residual scores were very high.

Some significant interactions between ACL scores and the course satisfaction outcome variable are presented in Table 37. For purposes of comparison, the correlations using both the raw and the residual scores are presented. As with CPI and SSHA scales, there were many highly significant interactions in Course A which were not replicated in Course B. As Table 37 indicates, even in the case of significant interactions across both courses, most of these interactions stemmed

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Insert Table 37 about here

Table 37

Correlations between ACL Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

(Female Students Only)

ACL Scales		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Adjustment	Q	.27	-.27	.28	-.22	2.12^{*}		.19	-.06	-.01	-.16	2.02^{*}
(Raw)	P	-.08	.06	-.19	-.07							
Adjustment	Q	.28	-.25	.26	-.22	2.15^{*}		.19	-.06	-.01	-.17	2.07^{*}
(Residual)	P	-.09	.05	-.17	-.08							
						(N)		(99)	(90)	(106)	(132)	
Exhibition	Q	-.02	.18	-.05	.15	.95	Q	.05		.05		2.66^{**}
(Raw)	P	-.24	-.41	-.27	.11		P	-.36		-.05		
Exhibition	Q	-.05	.16	.02	.14	.95	Q	.02		.07		2.56^{*}
(Residual)	P	-.22	-.40	-.34	.13		P	-.34		-.07		
Dominance	Q	-.01	.01	.07	.09	1.02	Q	.00		.07		2.36^{*}
(Raw)	P	-.21	-.27	-.38	.06		P	-.28		-.11		
Dominance	Q	-.03	-.02	.13	.08	1.09	Q	-.03		.09		2.21^{*}
(Residual)	P	-.17	-.26	-.42	.07		P	-.25		-.12		
Heterosexuality	Q	.23	.11	.13	-.11	2.08^{*}	Q	.18		-.01		2.36^{*}
(Raw)	P	-.11	-.26	-.33	.06		P	-.21		-.09		
Heterosexuality	Q	.22	.07	.20	-.12	1.97^{*}	Q	.17		.01		2.36^{*}
(Residual)	P	-.09	-.25	-.36	.14		P	-.18		-.11		
Abasement	Q	-.02	-.05	-.04	-.10	.95	Q	-.03		-.07		2.31^{*}
(Raw)	P	.09	.26	.39	-.07		P	.23		.13		
Abasement	Q	.00	-.03	-.08	-.10	.95	Q	-.02		-.08		2.26^{*}
(Residual)	P	.06	.25	.43	-.08		P	.21		.14		
(N)	Q	(58)	(38)	(46)	(54)	(N)	Q	(96)		(100)		
	P	(41)	(52)	(60)	(78)		P	(93)		(138)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$
$^{**}p < .01$

from effects produced in Course A. Whether the findings from Course A or Course B are more representative of those likely to be found in other college courses awaits further experimental investigation.

While none of the interactions between ACL scales and either the course achievement or the non-graded reading criteria were particularly noteworthy, a few involving the essay test score are presented in Table 38. Again, as in Table 37, the correlations are presented both for the raw and the residual scores. As would be predicted from the high correlations among these two sets of scores (see Table 36), their interaction effects were very similar.

Insert Table 38 about here

Welsh Figure Preference Test (WFPT)

From the 400-item Welsh Figure Preference Test, 22 scales (plus the total number of "Like" responses) were scored. Table 39 lists the means and standard deviations of these WFPT scales. As with the Adjective Check List, the mean scores for males and females were quite similar, although females disliked more drawings coded as male sex symbols than did male students. Unlike the ACL, however, the correlations between WFPT scale scores and the total number of items liked were substantial. Residual scores for each of the WFPT scales were again computed, with total "Like" scores partialled out. Table 39 presents the correlations between each of the WFPT raw scores and its corresponding residual scores, as well as its correlation with the total score. Most of the raw score vs. residual score correlations were considerably lower for the WFPT than for the ACL, again indicating the extent to which the WFPT "Liking" factor was a more significant source of response bias than the ACL "Endorsement" factor.

Insert Table 39 about here

Table 38

Correlations between ACL Scales and the Essay Test Score in Different Teaching Conditions

(Female Students Only)

ACL Scales		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Lability	Q	.23	-.14	.00	.16	1.31	Q	.11		.11		2.11*
(Raw)	P	-.20	-.09	-.10	-.04		P	-.14		-.06		
Lability	Q	.23	-.16	.05	.18	1.46	Q	.12		.16		2.36*
(Residual)	P	-.20	-.08	-.05	-.04		P	-.14		-.05		
						(N)	Q	(96)		(100)		
							P	(93)		(138)		
Aggression	Q	-.09	.10	.22	.26	.00		-.18	.11	-.04	.12	2.27*
(Raw)	P	-.30	.13	-.19	.00							
Aggression	Q	-.11	.11	.25	.28	.04		-.20	.12	.00	.14	2.32*
(Residual)	P	-.33	.13	-.16	.01							
Deference	Q	.16	-.20	-.19	-.19	.26		.20	-.15	.01	-.07	2.17*
(Raw)	P	.26	-.12	.13	.02							
Deference	Q	.20	-.23	-.24	-.23	.29		.24	-.18	-.04	-.10	2.42*
(Residual)	P	.28	-.14	.09	.02							
Autonomy	Q	-.11	.16	.13	.26	.04		-.16	.09	-.05	.10	2.02*
(Raw)	P	-.22	.03	-.16	.00							
Autonomy	Q	-.14	.19	.20	.31	.04		-.18	.12	.00	.14	2.22*
(Residual)	P	-.22	.05	-.13	.00							
(N)	Q	(58)	(38)	(46)	(54)			(99)	(90)	(106)	(132)	
	P	(41)	(52)	(60)	(78)							

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05

Table 39

Means and Standard Deviations of the WFPT Scales, Plus their Correlations with Total "Like" Responses and with the Residual Scores

WFPT Scales	Means				Standard Deviations				Correlations with: Total "Like"		Correlations with: Residual Scores	
	Males		Females		Males		Females		Males	Females	Males	Females
	A	B	A	B	A	B	A	B				
Art Scale (Original) (BW)	31	33	36	34	15	14	13	13	-.44	-.42	.90	.91
Art Scale (Revised) (RA)	33	36	38	35	14	14	12	13	-.28	-.27	.96	.96
Male-Female (MF)	23	24	26	25	7	7	6	6	-.04	-.04	1.00	1.00
Neuropsychiatric (NP)	16	15	13	14	7	6	5	6	.20	.15	.98	.99
Children (CN)	20	20	22	22	9	8	9	9	.11	.16	.99	.99
Ruled-Simple (RS)	15	18	19	18	11	10	9	10	-.68	-.67	.73	.74
Freehand-Simple (FS)	26	28	26	25	9	8	8	8	-.71	-.68	.70	.73
Ruled-Complex (RC)	16	18	18	18	10	9	8	9	-.84	-.78	.54	.63
Freehand-Complex (FC)	27	29	25	26	13	12	12	11	-.65	-.63	.76	.78
Ruled-Freehand (CO)	9	10	9	10	5	4	4	4	-.72	-.72	.70	.70
Shading (SH)	11	12	11	12	7	7	6	7	-.61	-.58	.79	.82
Black (BK)	20	23	23	23	12	11	10	10	-.81	-.75	.59	.66
Dotted Lines (DT)	21	24	24	22	10	8	8	8	-.83	-.79	.55	.62
Movement (MV)	35	35	37	36	5	5	4	4	-.16	-.11	.99	.99
Sex Symbol (Male)(XM)	12	13	15	15	6	6	5	6	-.88	-.83	.48	.56
Sex Symbol (Female) (XF)	13	15	14	13	6	6	5	6	-.89	-.87	.46	.50
Sex Symbol (Neutral) (XN)	16	18	18	17	7	6	6	6	-.77	-.71	.64	.71
Sex Symbol (Mixed) (XX)	13	13	13	13	6	5	5	5	-.78	-.73	.62	.69
Figure-Ground (FG)	14	15	15	15	2	3	3	3	-.10	-.12	.99	.99
Conformance (CF)	25	25	25	25	5	5	5	5	-.33	-.34	.94	.94
Structure (STR)	34	32	29	31	11	11	10	10	.13	.12	.99	.99
Symmetry (SYM)	25	25	24	25	6	5	6	5	-.16	-.08	.99	1.00
Total Like Responses (L)	191	168	173	178	86	74	67	72	1.00	1.00		
(N)	(178)	(177)	(186)	(236)					(380)	(455)		

Note: -- The Original Art Scale (BW) was constructed by Barron and Welsh (1952). The Structure (STR) and Symmetry (SYM) scales were developed for the present project by Gale Roid. All other scales were constructed by Welsh.

Table 40 summarizes the interactions between WFPT scales and the course satisfaction criterion. Again, as with the Adjective Check List, the findings for both raw and residual scores are presented for comparison. Considering the theoretical development of Barron's Revised Art Scale, the finding that this scale functions as a significant interaction variable with course satisfaction is a particularly interesting one. For male students there was a slight tendency for Art Scale scores to be correlated positively in the least structured (SP) teaching condition and zero or negatively in the most structured (LQ) condition.

Insert Table 40 about here

Table 41 presents some interactions between WFPT scales and the multiple-choice test score. Most of these interactions were at rather low significance levels and none of them involved both raw and residual scores for the same scale.

Insert Table 41 about here

Finally, Table 42 presents an interaction between the Revised Art Scale and the essay test score. For female students, there was a positive correlation between Art Scale and essay test scores in the Self-study condition, while there was a small negative correlation in the Lecture condition. This interaction, along with that involving the same scale and the course satisfaction outcome variable (Table 40), may well merit some further research.

Insert Table 42 about here

Table 40

Correlations between WFPT Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

	WFPT Scales		Course A		Course B		Z		Course A	Course B	Z
			L	S	L	S					
MALES	Rev. Art (Raw)	Q	.04	.13	-.22	.00	2.01*				
		P	.00	.30	-.02	.15					
	Rev. Art (Residual)	Q	.06	.17	-.17	-.12	2.17*				
		P	.07	.34	.05	.23					
	Movement (Raw)	Q	-.19	.24	-.07	-.29	2.08*				
		P	-.08	.30	.16	.09					
	Movement (Residual)	Q	-.18	.28	-.04	-.31	2.11*				
		P	-.04	.31	.20	.13					
	Ruled-Complex (Raw)	Q	.02	-.15	.00	.12	1.19	Q	-.07	.08	2.12*
		P	-.37	-.08	-.24	-.27		P	-.21	-.24	
	Ruled-Complex (Residual)	Q	.16	-.11	.36	.01	1.95	Q	.04	.20	1.98*
		P	-.23	.09	-.09	-.17		P	-.07	-.12	
	(N)	Q	(48)	(52)	(43)	(38)	(N)	Q	(100)	(81)	
		P	(42)	(37)	(52)	(44)		P	(79)	(96)	
FEMALES	Ruled-Freehand (Raw)	Q	.12	-.13	-.30	.09	2.10*	Q	.02	-.09	2.40*
		P	-.16	-.42	-.08	-.30		P	-.34	-.20	
	Ruled-Freehand (Residual)	Q	.16	-.12	-.13	.14	1.44	Q	.05	-.01	1.45
		P	-.10	-.20	-.02	-.16		P	-.15	-.10	
	Shading (Raw)	Q	.09	-.04	-.27	.17	1.22	Q	.04	-.01	2.20*
		P	-.07	-.31	-.24	-.20		P	-.20	-.21	
	Shading (Residual)	Q	.10	-.01	-.11	.23	.41	Q	.06	.08	1.35
		P	.01	-.05	-.26	-.07		P	.01	-.14	
	(N)	Q	(60)	(34)	(49)	(52)	(N)	Q	(94)	(101)	
		P	(40)	(51)	(58)	(77)		P	(91)	(135)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

*p < .05

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

Table 41

Correlations between WFPT Scales and the Multiple-choice Test Score in Different Teaching Conditions

	WFPT Scales		Course A L	Course A S	Course B L	Course B S	Z		Course A L	Course A S	Course B L	Course B S	Z
MALES	Ruled Freehand (Raw)	Q	-.27	-.09	-.32	.00	2.17*						
		P	-.03	-.03	-.12	.11							
	Ruled Freehand (Residual)	Q	-.34	-.42	-.31	.06	1.86						
		P	-.28	.02	.01	-.10							
	Black (Raw)	Q	.19	.19	.13	-.09	1.04		.22	.00	-.07	.03	.56
		P	.31	-.20	-.23	.19							
	Black (Residual)	Q	.33	.02	.27	-.07	2.64**		.24	-.10	.06	-.05	2.08*
		P	.21	-.20	-.14	-.02							
	(N)	Q	(48)	(52)	(43)	(38)			(90)	(89)	(95)	(82)	
		P	(42)	(37)	(52)	(44)							
FEMALES	Dotted Line (Raw)	Q	-.02	.34	.31	.07	.07	Q	.16		.18		.70
		P	.17	.04	-.04	.27		P	.08		.12		
	Dotted Line (Residual)	Q	.02	.36	.38	.23	1.44	Q	.15		.28		2.40*
		P	-.01	-.24	-.11	.26		P	-.14		.10		
	(N)	Q	(60)	(34)	(49)	(52)		(N) Q	(94)		(101)		
		P	(40)	(51)	(58)	(77)		P	(91)		(135)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 42

Correlations between WFPT Scales and the Essay Test Score in Different Teaching Conditions

(Female Students Only)

WFPT Scale		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
Rev. Art	Q	-.15	.09	.11	.13						
(Raw)	P	.05	.22	-.17	.24	1.85	-.07	.18	-.03	.20	2.40*
Rev. Art	Q	-.15	.01	.09	.09						
(Residual)	P	.01	.21	-.17	.23	1.85	-.08	.14	-.04	.17	2.15*
(N)	Q	(60)	(34)	(49)	(52)						
	P	(40)	(51)	(58)	(77)		(100)	(85)	(107)	(129)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05

Minnesota Multiphasic Personality Inventory (MMPI)

Table 43 lists the means and standard deviations of the 75 MMPI scales scored in the present project; the intercorrelations among these scales are available from the author. The first 13 scales listed in Table 43 are the validity and clinical scales from the MMPI, followed by Drake's Social Introversion, Taylor's Manifest Anxiety, and Edwards' Social Desirability scales. The next 14 MMPI scales were developed by Gough as forerunners of his CPI scales. Five scales developed by Welsh were included, as well as two response bias indices of Wiggins. Ten miscellaneous personality scales were scored, including Barron's Ego Strength scale and various measures of dependency, emotional immaturity, hostility, and college achievement. The 13 Revised Content scales of Wiggins were also included, as well as eight scales constructed by Block and seven cluster scales developed by Tryon.

Insert Table 43 about here

In order to check on the problem of careless or otherwise non-candid responding to this long inventory, the validity and faking scales were scrutinized carefully. From the 807 students who originally turned in MMPI protocols, 42 students were eliminated from the sample analyzed in the present project; the excluded subjects included all those who had _F_ scores of 15 or above. The means and standard deviations reported in Table 43 are based upon the responses from the remaining subsample (approximately 95% of the total sample), as are all of the interaction analyses to be presented.

In general, mean differences between the male and female samples were not large, except on the various masculinity-femininity scales (e.g., _Mf-f_, _Mf-m_, _Fe_, _FEM_). Male students had higher mean scores than females on Ego Strength, Factor

Table 43

The 75 M.M.P.I. Scales

	Means				Standard Deviations			
	Males		Females		Males		Females	
Standard Clinical Scales	A	B	A	B	A	B	A	B
Lie (L)	2	3	3	3	2	2	2	2
Validity (F)	5	5	4	4	3	3	3	3
Correction (K)	15	16	16	15	5	5	4	4
Hypochondriasis (Hs)	4	4	5	5	3	3	3	4
Depression (D)	18	18	20	20	5	4	4	4
Hysteria (Hy)	20	20	22	22	4	4	4	4
Psychopathic Deviancy (Pd)	17	17	16	15	4	5	4	4
Femininity (Female Key) (Mf-f)	30	30	38	39	5	5	5	4
Femininity (Male Key) (Mf-m)	28	28	36	36	5	5	5	4
Paranoia (Pa)	10	10	10	10	3	3	3	3
Psychasthenia (Pt)	13	12	13	14	7	7	7	7
Schizophrenia (Sc)	12	12	11	12	7	7	7	7
Hypomania (Ma)	19	19	17	19	4	4	5	4
Social Introversion (Si)	25	24	24	25	10	9	8	9
Manifest Anxiety (MAS)	15	14	16	17	8	8	7	8
Social Desirability (ESD)	31	32	31	30	6	5	5	5
Original CPI Scales (Gough)								
Dominance (Do)	11	11	10	11	2	2	2	3
Status (St)	12	12	13	13	3	2	2	2
Social Participation (Sp)	19	19	19	19	4	3	3	4
Social Presence (Sr)	16	17	16	16	3	3	3	3
Responsibility (Re)	14	14	16	15	3	2	2	2
Delinquency (De)	3	3	2	2	2	2	1	1
Impulsivity (Im)	9	9	9	9	3	3	3	3
Tolerance (To)	22	22	23	23	5	5	4	4
Academic Achievement (Ac)	13	14	14	14	3	3	2	2
Achievement via Independence (Ai)	12	12	12	12	2	2	2	2
Intellectual Efficiency (Ie)	32	32	32	32	4	3	3	3
Psychological Interests (Py)	4	4	4	4	1	1	1	1
Originality (Or)	13	13	14	14	3	3	3	3
Femininity (Fe)	6	6	9	9	2	2	2	2
Factor Scales (Welsh)								
Factor I (A)	12	12	12	13	8	8	8	8
Factor II (R)	15	15	16	16	4	4	4	4
Factor III (C)	17	16	14	14	5	4	4	5
Factor IV (P)	12	11	11	11	3	3	3	3
General Maladjustment (Gm)	7	6	6	6	3	3	3	3
Response Bias (Wiggins)								
Social Desirability (Sd)	13	13	13	13	4	4	4	4
Acquiescence (Rb)	14	14	14	14	3	3	3	3

Table 43
Page Two

	Means				Standard Deviations			
	Males		Females		Males		Females	
Miscellaneous Personality Scales	A	B	A	B	A	B	A	B
Personality Variance (G)	23	22	23	24	11	10	10	10
Ego Strength (Es)	50	51	48	47	5	5	5	5
Dependency (Dy)	20	19	22	23	9	8	8	8
Emotional Immaturity (Em)	13	12	13	13	6	5	5	5
Hostility Control (Hc)	7	7	7	8	3	3	3	3
Hostility (Ho)	19	19	15	16	8	8	7	7
Overt Hostility (Hv)	5	5	4	5	2	2	2	1
Under Achievement (Un)	12	12	13	13	2	2	2	2
College Achievement (Ae)	14	14	12	12	3	3	3	3
Facilitation-Inhibition (F-I)	32	33	32	31	7	7	6	6
Revised Content Scales (Wiggins)								
Social Maladjustment (SOC)	9	8	8	8	6	5	5	6
Depression (DEP)	7	6	7	7	5	5	4	4
Feminine Interests (FEM)	10	10	20	20	4	4	4	3
Poor Morale (MOR)	7	7	8	8	5	5	4	5
Religious Fundamentalism (REL)	5	5	5	6	3	3	3	3
Authority Conflict (AUT)	9	9	7	7	4	4	4	3
Psychoticism (PSY)	8	7	7	8	4	4	4	4
Organic Symptoms (ORG)	4	4	4	4	3	3	3	3
Family Problems (FAM)	5	4	4	5	3	2	3	3
Manifest Hostility (HOS)	10	10	8	9	4	5	5	4
Phobias (PHO)	5	5	7	7	3	3	4	4
Hypomania (HYP)	13	13	14	14	3	4	4	3
Poor Health (HEA)	4	4	5	5	3	3	3	3
Control Scales (Block)								
Psychoneurosis (Pn)	13	12	14	15	5	5	5	5
Beta Factor (Ec-4)	15	15	15	15	4	4	4	4
Ego Overcontrol (Eo)	10	10	10	10	3	3	3	3
Neurotic Overcontrol (Noc)	6	5	5	6	3	2	3	3
Neurotic Undercontrol (Nuc)	14	13	13	14	5	5	5	5
Alpha Factor (Er-O)	109	111	110	108	17	16	15	16
Beta Factor (Ec-5)	31	30	31	30	6	6	6	6
Alpha-Subtle (Er-5)	23	23	23	22	5	5	5	5
Cluster Scales (Tryon)								
Introversion (Cl-I)	5	4	5	5	5	4	4	4
Body Symptoms (C2-B)	2	2	2	2	2	2	2	2
Suspicion & Mistrust (C3-S)	7	7	6	6	4	4	4	3
Depression & Apathy (C4-D)	4	4	4	4	4	3	3	4
Resentment & Aggression (C5-R)	6	5	5	5	3	3	3	3
Autism & Disruptive Thoughts (C6-A)	5	5	5	5	3	3	3	3
Tension, Worry, & Fears (C7-T)	5	5	5	6	3	3	3	3
(N)	(160)	(162)	(181)	(219)				

III (*C*), Hostility (*Ho*), College Achievement (*Ae*), and Authority Conflict (*AUT*), while females had higher mean scores on such scales as Depression (*D*), Hysteria (*Hy*), Dependency (*Dy*), and Phobias (*PHO*).

Table 44 summarizes the major interactions between MMPI scales and the course satisfaction outcome variable. Welsh's Factor *R* scale figured in two of these interactions, but differently for males and females. Unfortunately, in the female sample a sizable Quiz vs. Paper interaction in Course A was not replicated in Course B. In general, when one considers the fact that 75 MMPI scales were analyzed, the number and nature of these few significant interactions should not compel the reader to accept them without further confirmation.

Insert Table 44 about here

The interactions between MMPI scales and the course achievement outcome variable are presented in Table 45. Once again, Welsh's Factor *R* scale was implicated in these interactions, especially for the female sample. Scores on the *R* scale were more highly correlated with course achievement in the most structured (LQ) than in the least structured (SP) sections of the two experimental courses. The fact that the *R* scale functioned as a significant interaction variable with both the satisfaction and the course achievement criteria suggests that it might be a good candidate for future experimental explorations.

Insert Table 45 about here

Table 46 summarizes the interactions between MMPI scales and the non-graded reading criterion variable. The most significant interactions with extracurricular

Insert Table 46 about here

Table 44

Correlations between MMPI Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

	MMPI Scales		Course A L	Course A S	Course B L	Course B S	Z		Course A L	Course A S	Course B L	Course B S	Z
MALES	R	Q	-.09	.34	-.15	.20	1.66		.00	.17	-.13	.26	2.51*
		P	.13	-.02	-.07	.32							
	HOS	Q	.00	-.28	-.01	-.09	.81		.05	-.11	.14	-.18	2.11*
		P	.11	.03	.18	-.30							
	(N)	Q	(43)	(41)	(39)	(39)			(84)	(76)	(82)	(80)	
		P	(41)	(35)	(43)	(41)							
FEMALES	REL	Q	.00	.07	.40	-.02	2.32*	Q	.03		.15		1.90
		P	-.25	-.27	-.03	.05		P	-.24		.03		
	Ae	Q	-.23	.02	.19	-.17	1.32	Q	-.16		.00		2.59**
		P	.24	.23	.21	.10		P	.24		.13		
	R	Q	-.11	-.14	.24	-.01	1.32	Q	-.12		.12		2.29*
		P	.26	.43	.10	.04		P	.39		.06		
	Hv	Q	-.02	.10	-.12	.24	.61	Q	.02		.08		2.29*
		P	-.16	-.27	-.25	-.03		P	-.25		-.11		
							(N)	Q	(93)		(93)		
								P	(88)		(126)		
	Sr	Q	-.13	.10	.06	.04	.93		-.14	.03	-.23	.10	2.44*
		P	.00	-.01	-.44	.20							
	Cl-I	Q	.09	-.21	-.08	.05	.75		.12	-.09	.19	-.06	2.24*
		P	.11	-.02	.44	-.18							
	(N)	Q	(57)	(36)	(44)	(49)			(94)	(87)	(99)	(120)	
		P	(37)	(51)	(55)	(71)							

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 45

Correlations between MMPI Scales and the Course Achievement Outcome Variable in Different Teaching Conditions

	MMPI Scales		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
MALES	Sp	Q	-.31	-.08	-.41	.07	2.32*						
		P	-.19	-.05	-.01	.06							
	PHO	Q	.31	-.18	.02	.08	2.17*						
		P	.07	-.17	-.06	-.21							
	Fe	Q	.32	.41	.18	.08	.63	Q	.37		.12		2.29*
		P	.01	.32	-.30	-.03		P	.14		-.15		
	(N)	Q	(43)	(41)	(39)	(39)		Q	(84)		(78)		
		P	(41)	(35)	(43)	(41)		P	(76)		(84)		
FEMALES	R	Q	.29	-.14	.37	.13	2.50*		.33	-.07	.15	.06	2.44*
		P	.37	-.03	-.02	.02							
	De	Q	-.24	.12	-.24	.12	2.00*		-.18	.10	-.11	.05	2.15*
		P	-.17	.09	.00	-.01							
	Em	Q	-.19	.36	.01	.14	1.07		-.18	.26	-.09	.03	2.78**
		P	-.15	.19	-.12	-.07							
	P	Q	-.06	.26	-.22	.10	1.82		-.07	.20	-.17	.07	2.49*
		P	-.03	.17	-.13	.06							
	(N)	Q	(57)	(36)	(44)	(49)			(94)	(87)	(99)	(120)	
		P	(37)	(51)	(55)	(71)							
TOTAL	R	Q	.30	.03	.42	.03	2.95**						
		P	.24	.05	.04	.09							
	(N)	Q	(100)	(77)	(83)	(88)							
		P	(78)	(86)	(98)	(112)							

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 46

Correlations between MMPI Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	MMPI Scales		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
	Py	Q	.18	.17	.37	.03	2.08*	Q	.18		.24		2.25*
M		P	.11	.00	-.19	-.12		P	.06		-.15		
	PHO	Q	-.41	.08	-.17	-.33	1.23	Q	-.23		-.24		2.69**
A		P	.02	-.20	.36	.00		P	-.07		.21		
	Pt	Q	-.26	-.10	-.10	-.26	.93	Q	-.20		-.18		2.11*
L		P	.01	.05	.20	-.11		P	.03		.07		
E	Pn	Q	-.31	-.13	-.05	-.28	.42	Q	-.24		-.17		2.11*
		P	.03	-.04	.26	-.19		P	.00		.07		
S	A	Q	-.39	.02	-.05	-.25	1.02	Q	-.23		-.15		2.03*
		P	-.02	.01	.28	-.13		P	-.01		.09		
	(N)	Q	(43)	(41)	(39)	(39)		Q	(84)		(78)		
		P	(41)	(35)	(43)	(41)		P	(76)		(84)		
	Rb	Q	.07	-.08	.12	-.21	2.46*		.05	-.25	.20	-.16	3.27**
F		P	.02	-.36	.25	-.12							
E	Or	Q	.23	.05	.04	-.01	1.96*		.08	.31	-.04	.18	2.24*
M		P	-.17	.50	-.15	.35							
A								(N)	(94)	(87)	(99)	(120)	
L	L	Q	-.10	-.16	-.20	.08	2.14*	Q	-.14		-.04		2.20*
E		P	.29	.14	-.04	.16		P	.19		.08		
S	(N)	Q	(57)	(36)	(44)	(49)		Q	(93)		(93)		
		P	(37)	(51)	(55)	(71)		P	(88)		(126)		
T	Or	Q	.16	.04	-.10	.02	2.86**		.12	.23	-.08	.14	2.19*
O		P	.05	.40	-.07	.24							
T	Rb	Q	.02	-.10	.14	-.24	2.67**		-.02	-.19	.13	-.17	3.11**
A		P	-.07	-.27	.12	-.12							
	(N)	Q	(100)	(77)	(83)	(88)			(178)	(163)	(181)	(200)	
L		P	(78)	(86)	(98)	(112)							

Note: -- See footnotes on previous tables.

reading occurred with Wiggins' Acquiescence Response Bias (Rb) and Gough's Originality (Or) scales. Especially in the female sample, scores on Rb were negatively correlated with non-graded reading in the Self-study condition and positively correlated in the Lecture condition. The results for Or were almost the opposite; Or was positively correlated with non-graded reading in the Self-study condition and showed no such relationship in the Lecture condition.

Finally, Table 47 presents the interactions between MMPI scales and the essay test score. While four of these interaction effects reached the .01 level of statistical significance, the reader is again cautioned against over-interpreting these findings in the light of the large number of MMPI scales analyzed. Fortunately, one MMPI finding was strikingly congruent with another reported previously: a significant interaction effect for Gough's MMPI Psychological-Mindedness scale was virtually identical to the effect produced by Py on the CPI (Table 20), in spite of the fact that this scale was imbedded in two different inventories which were administered over five weeks apart.

Insert Table 47 about here

Composite Personal Reaction Inventory (CPRI)

Unlike the inventories previously discussed, the CPRI and the CCPI (to be presented in the section to follow) were not published inventories. The Composite Personal Reaction Inventory consisted of 170 True-False items which included those in Barron's Originality Scale, the Marlowe-Crowne Social Desirability scale, Walk's Intolerance of Ambiguity scale, the Vogel-Raymond-Lazarus Achievement Values scale, and Sarason's Test Anxiety, Need for Achievement, and Lack of Protection scales. The means, standard deviations, and correlations among these seven scales are presented in Table 48. The mean scores of male and female students on

Table 47

Correlations between MMPI Scales and the Essay Test Score in Different Teaching Conditions

<table>
<tr><th rowspan="2"></th><th rowspan="2">MMPI Scales</th><th rowspan="2"></th><th colspan="2">Course A</th><th colspan="2">Course B</th><th rowspan="2">Z</th><th rowspan="2"></th><th rowspan="2"></th><th colspan="2">Course A</th><th colspan="2">Course B</th><th rowspan="2">Z</th></tr>
<tr><th>L</th><th>S</th><th>L</th><th>S</th><th>L</th><th>S</th><th>L</th><th>S</th></tr>
<tr><td>MALES</td><td>Hv</td><td>Q</td><td>-.09</td><td>-.24</td><td>-.32</td><td>-.09</td><td></td><td></td><td>Q</td><td colspan="2">-.18</td><td colspan="2">-.21</td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>.32</td><td>-.09</td><td>.02</td><td>-.14</td><td>.57</td><td></td><td>P</td><td colspan="2">.17</td><td colspan="2">-.03</td><td>2.60**</td></tr>
<tr><td></td><td>Im</td><td>Q</td><td>-.14</td><td>-.33</td><td>-.05</td><td>-.15</td><td></td><td></td><td>Q</td><td colspan="2">-.26</td><td colspan="2">-.11</td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>.33</td><td>.05</td><td>.00</td><td>-.18</td><td>.18</td><td></td><td>P</td><td colspan="2">.22</td><td colspan="2">-.06</td><td>2.38*</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>(N)</td><td>Q</td><td colspan="2">(84)</td><td colspan="2">(78)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>P</td><td colspan="2">(76)</td><td colspan="2">(84)</td><td></td></tr>
<tr><td></td><td>Re</td><td>Q</td><td>-.18</td><td>.42</td><td>.10</td><td>.00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>-.16</td><td>.25</td><td>.05</td><td>.15</td><td>1.48</td><td></td><td></td><td>-.16</td><td>.37</td><td>.04</td><td>.08</td><td>2.60**</td></tr>
<tr><td></td><td>De</td><td>Q</td><td>.27</td><td>-.43</td><td>.01</td><td>-.02</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>.18</td><td>.01</td><td>-.08</td><td>-.26</td><td>1.66</td><td></td><td></td><td>.19</td><td>-.27</td><td>-.03</td><td>-.11</td><td>2.42*</td></tr>
<tr><td></td><td>Ma</td><td>Q</td><td>-.08</td><td>-.29</td><td>-.21</td><td>-.15</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>.26</td><td>-.17</td><td>-.04</td><td>-.28</td><td>.51</td><td></td><td></td><td>.13</td><td>-.26</td><td>-.08</td><td>-.21</td><td>2.33*</td></tr>
<tr><td></td><td>(N)</td><td>Q</td><td>(43)</td><td>(41)</td><td>(39)</td><td>(39)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>(41)</td><td>(35)</td><td>(43)</td><td>(41)</td><td></td><td></td><td></td><td>(84)</td><td>(76)</td><td>(82)</td><td>(80)</td><td></td></tr>
<tr><td>FEMALES</td><td>Pt</td><td>Q</td><td>-.10</td><td>-.07</td><td>-.39</td><td>-.12</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>-.39</td><td>.23</td><td>-.09</td><td>-.04</td><td>2.50*</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Py</td><td>Q</td><td>.28</td><td>.02</td><td>.37</td><td>.17</td><td></td><td></td><td>Q</td><td colspan="2">.17</td><td colspan="2">.22</td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>.19</td><td>-.09</td><td>-.04</td><td>.02</td><td>2.68**</td><td></td><td>P</td><td colspan="2">.00</td><td colspan="2">-.03</td><td>2.05*</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>(N)</td><td>Q</td><td colspan="2">(93)</td><td colspan="2">(93)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>P</td><td colspan="2">(88)</td><td colspan="2">(126)</td><td></td></tr>
<tr><td></td><td>MOR</td><td>Q</td><td>-.15</td><td>-.03</td><td>-.34</td><td>-.19</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>-.33</td><td>.21</td><td>-.17</td><td>.03</td><td>2.64**</td><td></td><td></td><td>-.18</td><td>.08</td><td>-.24</td><td>-.08</td><td>2.05*</td></tr>
<tr><td></td><td>Im</td><td>Q</td><td>-.15</td><td>.18</td><td>-.37</td><td>.03</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td>P</td><td>-.14</td><td>.20</td><td>-.05</td><td>-.07</td><td>2.39*</td><td></td><td></td><td>-.14</td><td>.19</td><td>-.20</td><td>-.03</td><td>2.44*</td></tr>
</table>

Table 47
Page Two

	MMPI Scales		Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
FEMALES CONT.	P	Q	-.08	-.06	-.29	-.05						
		P	-.20	.24	-.21	.00	2.18*	-.11	.13	-.24	-.03	2.20*
	F-I	Q	.09	-.10	.34	.18						
		P	.39	-.18	.12	.00	2.21*	.18	-.12	.22	.09	2.10*
	C3-S	Q	-.11	.09	-.11	-.07						
		P	-.33	.03	-.24	.08	1.18	-.19	.04	-.18	.00	2.00*
	(N)	Q	(57)	(36)	(44)	(49)						
		P	(37)	(51)	(55)	(71)		(94)	(87)	(99)	(120)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Insert Table 48 about here

these scales were quite similar, though male students produced slightly higher scores on the Achievement Values scale. In general, the seven scales were quite independent, the highest intercorrelation being -.45 between Originality and Intolerance of Ambiguity.

Table 49 presents two significant interactions between CPRI scales and the course satisfaction outcome variable, one in the male sample and the other in the female sample. Unfortunately, the former stemmed almost completely from the students in one of the two experimental courses.

Insert Table 49 about here

Table 50 presents two more significant interaction effects, this time with the non-graded reading criterion. Again, a large interaction effect in one course was not strongly replicated in the other.

Insert Table 50 about here

Table 51, on the other hand, illustrates an interaction effect which did replicate across courses, especially for female subjects. The Achievement Values scale was more highly correlated with the course achievement criterion in Quiz sections than in Paper sections. This rather striking effect should be explored in subsequent investigations.

Insert Table 51 about here

Table 48

Means, Standard Deviations, and Intercorrelations among Seven Scales from the Composite Personal Reaction Inventory (CPRI)

			1	2	3	4	5	6	7
Originality (Barron)	ORIG	1		-.20	-.45	-.13	-.21	-.04	.13
Social Desirability (Marlowe-Crowne)	MCSD	2	-.29		.20	-.16	-.08	-.24	.07
Intolerance of Ambiguity (Walk)	I-A	3	-.44	.18		.16	.21	.14	.10
Test Anxiety (Sarason)	ANX	4	-.14	-.11	.20		.33	.42	.06
Need for Achievement (Sarason)	ACH	5	-.22	-.06	.30	.33		.38	.10
Lack of Protection (Sarason)	L-P	6	.01	-.28	.14	.39	.39		.09
Achievement Values (Vogel-Raymond-Lazarus)	A-V	7	.19	.04	.07	-.07	-.10	.09	

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
ORIG	13	13	13	13	3	3	3	3
MCSD	13	13	14	14	6	5	5	5
I-A	2	2	2	2	2	2	1	2
ANX	6	6	6	6	4	4	4	4
ACH	12	12	12	12	5	5	5	5
L-P	8	8	8	9	4	5	4	5
A-V	6	5	4	4	2	2	2	2
(N)	(168)	(169)	(186)	(221)				

Note: -- Correlations above the main diagonal are from the total male sample (N = 356), while those below the main diagonal are from the total female sample (N = 426).

Table 49

Correlations between Composite Personal Reaction Inventory (CPRI) Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

	CPRI Scales		Course A		Course B		Z		Course A	Course B	Z
			L	S	L	S			L S	L S	
MALES	L-P	Q	-.51	-.25	-.07	.00	2.01*	Q	-.38	.00	2.60**
		P	.25	.00	.06	.04		P	.11	.07	
	(N)	Q	(44)	(49)	(37)	(40)		Q	(93)	(77)	
		P	(40)	(35)	(51)	(41)		P	(75)	(92)	
FEMALES	ACH	Q	.05	.15	.05	.07	1.52	Q	.09	.08	2.36*
		P	-.20	-.23	-.17	-.09		P	-.19	-.12	
	(N)	Q	(57)	(38)	(47)	(49)		Q	(95)	(96)	
		P	(38)	(53)	(57)	(68)		P	(91)	(125)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 50

Correlations between Composite Personal Reaction Inventory (CPRI) Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	CPRI Scales		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
MALES	I-A	Q	-.45	-.08	-.22	-.15	2.37^{*}						
		P	-.21	.24	-.14	-.15							
	(N)	Q	(44)	(49)	(37)	(40)							
		P	(40)	(35)	(51)	(41)							
FEMALES	ORIG	Q	.17	.38	.23	.12	1.19	Q	.26		.17		2.27^{*}
		P	-.25	.13	.00	-.06		P	.00		-.03		
	(N)	Q	(57)	(38)	(47)	(49)		Q	(95)		(96)		
		P	(38)	(53)	(57)	(68)		P	(91)		(125)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*$p < .05$

Table 51

Correlations between Composite Personal Reaction Inventory (CPRI) Scales and the Course Achievement Outcome Variable in Different Teaching Conditions

	CPRI Scales		Course A		Course B		Z		Course A	Course B	Z
			L	S	L	S			L S	L S	
TOTAL	A-V	Q	.11	.18	.25	.28	2.25*	Q	.14	.27	3.36**
		P	.03	-.11	-.04	.01		P	-.08	-.01	
	(N)	Q	(101)	(87)	(84)	(89)		Q	(188)	(173)	
		P	(78)	(88)	(108)	(109)		P	(166)	(217)	
FEMALES	A-V	Q	.22	.18	.29	.45	2.42*	Q	.20	.37	3.30**
		P	.10	-.14	-.04	-.01		P	-.05	-.03	
	(N)	Q	(57)	(38)	(47)	(49)		Q	(95)	(96)	
		P	(38)	(53)	(57)	(68)		P	(91)	(125)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Composite Choice Preference Inventory (CCPI)

Like the CPRI, the CCPI combined a set of single scales previously reported separately in the psychometric literature. The CCPI consisted of 156 forced-choice items, which included the Theoretical, Economic, Aesthetic, Social, Political, and Religious scales from Part I of the Allport-Vernon-Lindzey Study of Values, plus the Locus of Control scale (sometimes called the Internal-External Control scale) developed by Rotter and his students, Zuckerman's Sensation-seeking scales, and forced-choice versions of Rokeach's Dogmatism scale and the California F-scale. For the latter two measures, 40 original Dogmatism items were paired with 40 reversals constructed by Peabody, and 20 original F-scale items were paired with 29 reversals constructed by Jackson and Messick. Although all of the items in each scale were presented together, the order of original and reversed items was counterbalanced.

Table 52 presents the means, standard deviations, and correlations among the 12 scales from the CCPI. Again, as with the CPRI, the scales were quite independent, the only exceptions being the three Sensation-seeking scales. While correlations between the original versions of the F-scale and the Dogmatism scale are typically rather high, the forced-choice variants of these scales correlated only .36 and .29, in the male and female samples respectively. Mean scores from male and female subjects on all of the CCPI scales were quite similar.

Insert Table 52 about here

Two rather weak, though statistically significant, interaction effects involving CCPI scales and the non-graded reading outcome variable are presented in Table 53. For male students, the forced-choice Dogmatism scale was negatively

----
Insert Table 53 about here

Table 52

Means, Standard Deviations, and Intercorrelations among Twelve Scales from the Composite Choice Preference Inventory (CCPI)

			1	2	3	4	5	6	7	8	9	10	11	12
Locus of Control	L-C	1		-.02	.03	.03	.02	-.06	.01	-.08	-.06	-.06	.37	.25
Theoretical Values	T	2	-.04		-.37	-.09	-.15	-.20	-.21	-.01	-.02	-.01	-.01	.01
Economic Values	E	3	.02	-.35		-.16	-.15	-.24	-.11	.03	.06	.05	-.03	-.07
Aesthetic Values	A	4	.00	-.06	-.25		-.33	-.22	-.24	.04	.04	.04	-.01	.03
Social Values	S	5	-.07	-.27	-.16	-.25		-.17	-.26	-.02	-.02	-.03	-.09	-.11
Political Values	P	6	.06	-.18	-.19	-.28	-.08		-.08	.05	.06	.05	.06	-.01
Religious Values	R	7	.04	-.21	-.18	-.19	-.20	-.14		-.10	-.13	-.10	.10	.16
Sensation-Seeking Male	SS(M)	8	-.10	-.02	.00	.00	-.09	.12	.00		.94	.97	-.23	-.28
Sensation-Seeking Female	SS(F)	9	-.09	-.03	.00	-.01	-.08	.12	.01	.95		.96	-.24	-.30
Sensation-Seeking Male & Female	SS(T)	10	-.09	-.02	-.01	.01	-.08	.10	.01	.97	.96		-.22	-.29
Dogmatism (F-C)	D	11	.31	-.02	-.05	.01	-.03	-.01	.12	-.21	-.18	-.19		.36
F-Scale (F-C)	F	12	.21	-.02	-.04	-.03	-.01	.01	.11	-.27	-.29	-.28	.29	

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
L-C	8	9	9	10	4	4	4	4
T	5	5	5	5	2	1	2	1
E	5	6	5	5	2	1	2	2
A	5	5	6	6	2	1	1	2
S	6	6	5	5	1	2	1	1
P	4	4	4	5	1	1	1	1
R	4	4	4	4	1	1	1	1
SS(M)	16	16	16	16	4	4	5	4
SS(F)	18	18	18	18	4	5	5	5
SS(T)	13	14	14	13	3	4	4	4
D	12	12	10	11	5	5	4	4
F	12	13	12	13	4	4	3	3
(N)	(166)	(172)	(181)	(217)				

Note: -- Correlations above the main diagonal are from the total male sample (N = 350), while those below the main diagonal are from the total female sample (N = 418).

Table 53

Correlations between Composite Choice Preference Inventory (CCPI) Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	CCPI Scales		Course A		Course B		Z
			L	S	L	S	
MALES	D	Q	.12	.01	.10	-.07	2.05*
		P	-.31	-.18	.13	-.27	
	(N)	Q	(44)	(48)	(39)	(39)	
		P	(41)	(33)	(50)	(44)	
FEMALES	S	Q	.04	-.04	-.07	.14	2.04*
		P	.10	.35	.02	.17	
	(N)	Q	(54)	(37)	(45)	(48)	
		P	(37)	(53)	(55)	(69)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*$p < .05$

correlated with extracurricular reading in the least structured (SP) sections and positively correlated in the most structured (LQ) sections. Among female students, Social Values were positively correlated with the amount of non-graded reading in the least structured section (SP) and not so related in the other sections.

Table 54 summarizes the interactions between CCPI scales and the course achievement outcome variable. Again, as in Table 53, the forced-choice Dogmatism scale produced an interaction for the male students, and the Social Values scale produced one for the female students. However, neither effect was very large.

Insert Table 54 about here

Bass' Social Acquiescence Scale (BSAS)

Bass' 56-item Social Acquiescence Scale was administered as a separate inventory, entitled the "Inventory of Beliefs." This scale consists of 56 proverbs (e.g., "He who laughs last laughs longest." "The restless sleeper blames the couch." "Still water runs deep."), for each of which the subject is asked to indicate whether he (a) agrees, (b) somewhat agrees, (c) somewhat disagrees, or (d) disagrees. Seven indices were scored from the BSAS, and the means, standard deviations, and correlations among them are presented in Table 55. The average subject agreed (in one form or another) with about 54% of the proverbs and disagreed with the remaining 46%. Moreover, the average subject was sure enough of his opinion on about 38% of these items to respond in one of the two extreme response categories.

Insert Table 55 about here

Table 54

Correlations between Composite Choice Preference Inventory (CCPI) Scales and the Course Achievement Outcome Variable in Different Teaching Conditions

	CCPI Scales		Course A		Course B		Z		Course A		Course B		Z
			L	S	L	S			L	S	L	S	
MALES	E	Q	-.07	.16	-.10	-.02	1.78		-.14	.12	-.07	.13	2.07*
		P	-.19	.16	-.06	.25							
								(N)	(85)	(81)	(89)	(83)	
	F	Q	.07	-.05	-.02	-.20	1.78	Q	.00		-.13		2.33*
		P	-.46	-.06	-.26	-.45		P	-.27		-.35		
	D	Q	.18	.05	.09	.18	1.09	Q	.11		.12		2.24*
		P	-.35	-.22	-.10	.13		P	-.28		.02		
	(N)	Q	(44)	(48)	(39)	(39)		(N) Q	(92)		(78)		
		P	(41)	(33)	(50)	(44)		P	(74)		(94)		
FEMALES	S	Q	-.03	-.15	-.27	-.24	2.14*	Q	-.03		-.26		2.43*
		P	-.05	.24	.07	.05		P	.14		.06		
								(N) Q	(91)		(93)		
								P	(90)		(124)		
	SS(T)	Q	-.18	.16	.09	.10	1.64		-.17	.26	.05	.06	2.20*
		P	-.12	.32	.01	.04							
	SS(F)	Q	-.19	.17	.09	.08	1.79		-.14	.27	.05	.06	2.10*
		P	-.06	.33	.02	.06							
	(N)	Q	(54)	(37)	(45)	(48)			(91)	(90)	(100)	(117)	
		P	(37)	(53)	(55)	(69)							

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05

3

Table 55

Means, Standard Deviations, and Intercorrelations among Seven Indices from Bass' Social Acquiescence Scale (BSAS)

		1	2	3	4	5	6	7
# "Agree"	1		-.11	-.51	-.24	.43	.64	.70
# "Somewhat Agree"	2	-.29		.03	-.70	-.72	.70	.58
# "Somewhat Disagree"	3	-.58	.19		-.41	-.72	-.34	-.12
# "Disagree"	4	-.31	-.64	-.29		.78	-.72	-.83
Extremeness	5	.55	-.80	-.73	.62		-.25	-.32
Acquiescence-I	6	.68	.50	-.38	-.77	-.11		.95
Acquiescence-II	7	.77	.35	-.26	-.82	-.09	.96	

	Means				Standard Deviations			
	Males		Females		Males		Females	
	A	B	A	B	A	B	A	B
# "Agree"	9	8	11	11	6	7	8	7
# "Somewhat Agree"	20	20	20	20	7	7	6	6
# "Somewhat Disagree"	15	15	13	14	7	7	6	5
# "Disagree"	12	12	12	11	9	10	8	8
Extremeness	21	20	23	22	10	11	9	9
Acquiescence-I	29	28	31	31	9	9	9	8
Acquiescence-II	81	81	87	86	21	21	21	19
(N)	(184)	(182)	(194)	(234)				

Note: -- The first four indices are the number of responses (out of 56) to which the subject responded "agree," "somewhat agree," "somewhat disagree," and "disagree," respectively. The extremeness index is the sum of the "agree" and "disagree" tallies. Acquiescence-I is the sum of the "agree" and "somewhat agree" tallies; Acquiescence-II is the sum of all 56 responses, where "agree" = 3, "somewhat agree" = 2, "somewhat disagree" = 1, and "disagree" = 0. Correlations above the main diagonal are from the total male sample (N = 392), while those below the diagonal are from the total female sample (N = 462).

Some significant interactions involving BSAS indices are presented in Tables 56 and 57. For female students, the composite Acquiescence scores correlated positively with course satisfaction in the Quiz sections and showed no such correlation in the Paper sections. For male students, "somewhat disagree" responses were positively correlated with essay test scores in the most structured (LQ), and negatively correlated in the least structured (SP), sections. Both of these findings obviously need independent confirmation.

Insert Tables 56 and 57 about here

Reported Behavior Inventory (RBI)

Two unpublished "inventories" were included in the test battery in the expectation that their items would prove especially useful for the construction of empirical interaction scales (See Chapter V). These two experimental item pools, the Reported Behavior Inventory (RBI) and the Oregon Instructional Preference Inventory (OIPI), are included in the present report as Appendices C and D, respectively. Since preliminary scales from the latter inventory did not produce any significant interaction effects, the OIPI will not be further discussed in the present chapter.

The Reported Behavior Inventory consisted of 250 specific acts (e.g., "Donated blood," "Been to a foreign country," "Kept a diary," "Smoked a cigar," "Drunk champagne," "Stolen anything," "Acted in a play," "Broken any bones"). Subjects were asked to indicate whether they had, or had not, ever carried out the activity. Previous research has shown that responses to these rather specific behavioral items are quite stable over time, and scales constructed from this item pool have unusually high test-retest reliability coefficients. Fifteen rational-intuitive scales have been constructed for the RBI, plus a total score (the total number of activities which the subject reports having carried out).

Table 56

Correlations between Bass' Social Acquiescence Scale (BSAS) and the Course Satisfaction Outcome Variable in Different Teaching Conditions

(Female Students Only)

BSAS Index		Course A L	Course A S	Course B L	Course B S	Z		Course A L S	Course B L S	Z
Acquiescence	Q	.15	.18	.22	.11		Q	.16	.16	
II	P	-.38	-.01	.02	.03	1.29	P	-.17	.02	2.37^*
Acquiescence	Q	.18	.11	.26	.11		Q	.16	.18	
I	P	-.35	.01	-.01	.06	1.40	P	-.14	.03	2.27^*
(N)	Q	(59)	(40)	(48)	(51)		Q	(99)	(99)	
	P	(42)	(53)	(60)	(75)		P	(135)	(95)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^*p < .05$

Table 57

Correlations between Bass' Social Acquiescence Scale (BSAS) and the Essay Test Score in Different Teaching Conditions

(Male Students Only)

BSAS Index		Course A		Course B		Z
		L	S	L	S	
"Somewhat	Q	.40	.19	.12	.08	
Disagree"	P	.19	-.08	-.03	-.21	2.62^{**}
(N)	Q	(49)	(55)	(45)	(40)	
	P	(44)	(36)	(53)	(44)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{**}p < .01$

The means and standard deviations of these preliminary RBI scales are presented in Table 58. Male students had higher mean scores than females on such RBI scales as Foibles, Exhibition, Zest, and Affiliation, while female students achieved higher scores on the Scholastic scale. For each of the 15 RBI scales, residual scores were constructed (total scores being partialled out) in the same manner has has already been described for the ACL and WFPT. The correlations between each of the RBI raw scores and their residual counterparts, as well as the raw score vs. total score correlations, are presented in Table 58. Like the WFPT scales, most of the RBI scales were highly correlated with the total score, and thus the raw vs. residual score correlations were considerably lower than those from the ACL. In Tables 59 to 62, which present the interactions between RBI scales and course outcome variables, the correlations for both raw and residual scores are always included for comparison purposes.

Insert Table 58 about here

Table 59 summarizes some significant interactions between RBI scales and the course satisfaction outcome variable. For male students the residual Extroversion score, and for female students the Maturity score, both showed significant interactions with course satisfaction for the Quiz vs. Paper treatment comparisons.

Insert Table 59 about here

Table 60 presents the interactions of RBI scales with the course achievement criterion. A set of highly-correlated RBI scales produced significant interactions for the Lecture vs. Self-study teaching treatments. The most substantial of these

----
Insert Table 60 about here

Table 58

Means and Standard Deviations of the Reported Behavior Inventory Scales,

Plus their Correlations with Total R.B.I. Scores

and with the Residual Scores

RBI Scales	Means				Standard Deviations				Correlations with: Total Score		Correlations with: Residual Scores	
	Males		Females		Males		Females		Males	Females	Males	Females
	A	B	A	B	A	B	A	B				
Altruism (12)[a]	8	8	8	8	2	2	2	1	.60	.62	.80	.79
Status (18)	10	10	11	11	3	3	3	2	.64	.61	.77	.79
Travel (6)	4	5	4	4	1	1	1	1	.42	.34	.91	.94
Foibles (21)	13	14	10	10	5	4	4	4	.62	.59	.78	.81
Activity (17)	11	12	11	11	3	3	2	2	.63	.56	.78	.83
Affiliation (39)	28	29	25	25	5	5	5	5	.78	.76	.63	.65
Assertiveness (13)	10	11	10	10	2	2	2	2	.60	.57	.80	.83
Extroversion (70)	49	49	46	47	8	8	7	7	.91	.87	.41	.48
Sociability (26)	16	16	16	17	3	3	3	3	.78	.72	.63	.70
Somatic (30)	22	22	22	21	3	3	3	3	.60	.53	.80	.85
Exhibition (72)	42	42	35	35	10	10	8	9	.87	.84	.50	.54
Maturity (58)	41	43	41	42	5	5	5	4	.75	.78	.66	.64
Zest (31)	22	23	18	18	5	4	4	4	.73	.68	.68	.72
Culture (31)	21	22	22	22	4	3	3	3	.56	.62	.82	.79
Scholastic (56)	28	28	34	33	6	6	5	5	-.40	-.36	.92	.93
Total Score (250)	170	173	161	162	23	22	19	18	1.00	1.00		
(N)	(178)	(178)	(189)	(230)					(375)	(453)		

[a] Number of items in the scale.

Table 59

Correlations between Reported Behavior Inventory (RBI) Scales and the Course Satisfaction Outcome Variable in Different Teaching Conditions

	RBI Scales		Course A		Course B		Z		Course A	Course B	Z
			L	S	L	S			L S	L S	
MALES	Altruism (Raw)	Q	-.22	-.23	-.29	-.23	1.46	Q	-.22	-.24	1.89
		P	-.15	.13	.11	-.18		P	-.02	-.03	
	Altruism (Residual)	Q	-.30	-.13	-.28	-.24	1.78	Q	-.20	-.26	2.21*
		P	-.18	.21	.22	-.24		P	.00	.01	
	Extroversion (Raw)	Q	.15	-.17	-.06	.02	1.21	Q	-.01	.01	.97
		P	-.06	-.21	-.10	-.09		P	-.13	-.08	
	Extroversion (Residual)	Q	.30	.11	.16	.06	3.18**	Q	.20	.10	2.58**
		P	-.06	-.34	.05	-.20		P	-.19	-.07	
	(N)	Q	(46)	(51)	(43)	(39)		Q	(97)	(82)	
		P	(44)	(36)	(53)	(43)		P	(80)	(96)	
FEMALES	Maturity (Raw)	Q	.06	-.06	.11	-.01	2.09*	Q	.01	.03	2.15*
		P	-.10	-.28	-.10	-.11		P	-.27	-.11	
	Maturity (Residual)	Q	-.10	.10	.20	.02	1.87	Q	-.02	.08	1.95
		P	-.17	-.23	-.10	-.18		P	-.19	-.14	
	(N)	Q	(57)	(39)	(48)	(50)		Q	(96)	(98)	
		P	(40)	(53)	(56)	(76)		P	(93)	(132)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 60

Correlations between Reported Behavior Inventory (RBI) Scales

and the Course Achievement Outcome Variable

in Different Teaching Conditions

(Male Students Only)

RBI Scales		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Assertiveness	Q	-.27	.01	-.31	.42							
(Raw)	P	-.24	-.14	-.24	-.13	1.03		-.26	-.06	-.28	.16	3.06**
Assertiveness	Q	-.14	.14	-.15	.36							
(Residual)	P	-.12	.02	-.07	.03	1.06		-.15	.05	-.11	.19	2.31*
Extroversion	Q	-.51	-.10	-.39	.19							
(Raw)	P	-.28	-.32	-.27	-.11	1.65		-.38	-.17	-.33	.04	2.82**
Extroversion	Q	-.49	.08	-.17	.01							
(Residual)	P	-.11	-.32	-.11	.18	1.74		-.29	-.08	-.13	.11	2.13*
Sociability	Q	-.43	-.09	-.14	.20							
(Raw)	P	-.22	-.12	-.29	-.11	1.15		-.31	-.08	-.23	.05	2.50*
Sociability	Q	-.26	.06	.24	.09							
(Residual)	P	-.06	.06	-.20	.12	.65		-.17	.08	-.02	.09	1.67
Affiliation	Q	-.34	-.03	-.40	.15							
(Raw)	P	-.27	-.10	-.23	-.24	1.34		-.27	-.03	-.31	-.03	2.50*
Affiliation	Q	-.09	.17	-.15	.04							
(Residual)	P	-.06	.07	-.06	-.13	.56		-.06	.15	-.10	-.04	1.25
							(N)	(90)	(87)	(96)	(82)	
Foibles	Q	-.21	-.23	-.23	-.10		Q	-.22		-.18		
(Raw)	P	.09	-.05	-.04	.04	1.34	P	.02		.00		1.94
Foibles	Q	-.01	-.19	-.04	-.29		Q	-.10		-.17		
(Residual)	P	.28	.10	.13	.24	1.21	P	.20		.16		2.90**
(N)	Q	(46)	(51)	(43)	(39)		Q	(97)		(82)		
	P	(44)	(36)	(53)	(43)		P	(80)		(96)		

Note: -- See footnotes on previous tables.

interactions involved the Assertiveness scale, which correlated negatively with achievement in the Lecture sections and positively in the Self-study sections. In contrast to the findings presented in Table 59, these interactions were generally significant for both raw and residual scores.

Table 61 summarizes the interactions between RBI scales and the non-graded reading outcome variable. For female students, Assertiveness scores were negatively correlated with extracurricular reading in the Lecture sections and positively correlated in the Self-study sections.

Insert Table 61 about here

Table 62 presents the interactions between RBI scales and the essay test score. Female students who reported many altruistic experiences achieved higher essay scores than those who reported fewer such activities in the Paper sections of both courses, while no such relationship held in the Quiz sections. Obviously this finding, like all of the other significant interactions, demands further experimental confirmation.

Insert Table 62 about here

Predicted Peer Ratings on CPI Traits

One final questionnaire, entitled the "Accuracy of Self-Insight Scale," was administered with the following directions: "Imagine yourself in the shoes of other individuals who have to interact with you as a peer (i.e., friends and acquaintances, on and off campus). How do they view you? How accurately can you estimate the way you are perceived by others? Estimate, as accurately as possible, how others would rate you on each of the following traits. . . . Rate yourself as

Table 61

Correlations between Reported Behavior Inventory (RBI) Scales and the Non-graded Reading Outcome Variable in Different Teaching Conditions

	RBI Scales		Course A		Course B		Z	Course A		Course B		Z
			L	S	L	S		L	S	L	S	
MALES	Status	Q	-.09	.07	-.19	-.16						
	(Raw)	P	-.27	.06	-.23	.07	1.28	-.18	.07	-.21	-.06	1.85
	Status	Q	-.20	.18	-.06	-.04						
	(Residual)	P	-.21	.21	-.04	.16	1.96*	-.21	.19	-.03	.04	2.18*
	(N)	Q	(46)	(51)	(43)	(39)						
		P	(44)	(36)	(53)	(43)		(90)	(87)	(96)	(82)	
FEMALES	Affiliation	Q	-.09	-.28	.08	-.17						
	(Raw)	P	-.14	-.18	.07	-.16	1.21	-.11	-.20	.05	-.17	1.55
	Affiliation	Q	.12	-.04	.20	-.02						
	(Residual)	P	.07	-.16	.18	-.08	2.05*	.09	-.14	.18	-.05	2.30*
	Assertiveness	Q	-.17	.17	-.05	.01						
	(Raw)	P	-.28	.01	-.20	-.02	.77	-.21	.12	-.14	.00	2.35*
	Assertiveness	Q	-.04	.40	-.01	.15						
	(Residual)	P	-.18	.10	-.21	.07	.81	-.10	.25	-.11	.11	2.90**
	(N)	Q	(57)	(39)	(48)	(50)						
		P	(40)	(53)	(56)	(76)		(97)	(92)	(104)	(126)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$
$^{**}p < .01$

Table 62

Correlations between Reported Behavior Inventory (RBI) Scales and the Essay Test Score in Different Teaching Conditions

(Female Students Only)

<table>
<tr><th rowspan="2">RBI
Scales</th><th></th><th colspan="2">Course A</th><th colspan="2">Course B</th><th rowspan="2">Z</th><th></th><th colspan="2">Course A</th><th colspan="2">Course B</th><th rowspan="2">Z</th></tr>
<tr><th></th><th>L</th><th>S</th><th>L</th><th>S</th><th></th><th>L</th><th>S</th><th>L</th><th>S</th></tr>
<tr><td>Altruism</td><td>Q</td><td>-.16</td><td>.28</td><td>-.17</td><td>.03</td><td>3.04**</td><td>Q</td><td colspan="2">.01</td><td colspan="2">-.10</td><td>2.60**</td></tr>
<tr><td>(Raw)</td><td>P</td><td>.00</td><td>.33</td><td>.32</td><td>.16</td><td></td><td>P</td><td colspan="2">.19</td><td colspan="2">.24</td><td></td></tr>
<tr><td>Altruism</td><td>Q</td><td>-.14</td><td>.37</td><td>-.07</td><td>-.08</td><td>2.42*</td><td>Q</td><td colspan="2">.07</td><td colspan="2">-.10</td><td>2.10*</td></tr>
<tr><td>(Residual)</td><td>P</td><td>.01</td><td>.24</td><td>.29</td><td>.21</td><td></td><td>P</td><td colspan="2">.13</td><td colspan="2">.25</td><td></td></tr>
<tr><td>Exhibition</td><td>Q</td><td>-.23</td><td>-.19</td><td>-.25</td><td>-.01</td><td>2.23*</td><td>Q</td><td colspan="2">-.22</td><td colspan="2">-.13</td><td>2.20*</td></tr>
<tr><td>(Raw)</td><td>P</td><td>-.07</td><td>.23</td><td>.07</td><td>-.11</td><td></td><td>P</td><td colspan="2">.12</td><td colspan="2">-.03</td><td></td></tr>
<tr><td>Exhibition</td><td>Q</td><td>-.27</td><td>-.20</td><td>-.18</td><td>-.22</td><td>1.14</td><td>Q</td><td colspan="2">-.24</td><td colspan="2">-.20</td><td>1.35</td></tr>
<tr><td>(Residual)</td><td>P</td><td>-.09</td><td>.03</td><td>-.12</td><td>-.18</td><td></td><td>P</td><td colspan="2">-.03</td><td colspan="2">-.14</td><td></td></tr>
<tr><td>Sociability</td><td>Q</td><td>.00</td><td>.06</td><td>-.37</td><td>.02</td><td>2.16*</td><td>Q</td><td colspan="2">.02</td><td colspan="2">-.18</td><td>2.05*</td></tr>
<tr><td>(Raw)</td><td>P</td><td>.15</td><td>.21</td><td>.17</td><td>-.01</td><td></td><td>P</td><td colspan="2">.18</td><td colspan="2">.07</td><td></td></tr>
<tr><td>Sociability</td><td>Q</td><td>.08</td><td>.13</td><td>-.32</td><td>-.11</td><td>.88</td><td>Q</td><td colspan="2">.10</td><td colspan="2">-.23</td><td>1.25</td></tr>
<tr><td>(Residual)</td><td>P</td><td>.20</td><td>.00</td><td>.08</td><td>-.01</td><td></td><td>P</td><td colspan="2">.09</td><td colspan="2">.03</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>(N)</td><td>Q</td><td colspan="2">(96)</td><td colspan="2">(98)</td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>P</td><td colspan="2">(93)</td><td colspan="2">(132)</td><td></td></tr>
<tr><td>Activity</td><td>Q</td><td>-.03</td><td>-.10</td><td>.21</td><td>-.05</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>(Raw)</td><td>P</td><td>.17</td><td>.08</td><td>.22</td><td>-.17</td><td>.99</td><td></td><td>.03</td><td>.04</td><td>.21</td><td>-.08</td><td>1.40</td></tr>
<tr><td>Activity</td><td>Q</td><td>.04</td><td>-.10</td><td>.42</td><td>-.16</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>(Residual)</td><td>P</td><td>.22</td><td>-.09</td><td>.11</td><td>-.18</td><td>2.78**</td><td></td><td>.10</td><td>-.07</td><td>.24</td><td>-.13</td><td>2.70**</td></tr>
<tr><td>(N)</td><td>Q</td><td>(57)</td><td>(39)</td><td>(48)</td><td>(50)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>P</td><td>(40)</td><td>(53)</td><td>(56)</td><td>(76)</td><td></td><td></td><td>(97)</td><td>(92)</td><td>(104)</td><td>(126)</td><td></td></tr>
</table>

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

you think others would rate you, not necessarily as you know yourself to be or as you might wish to be. A high score on this inventory comes through estimating as accurately as possible the reactions of others to you." Following these instructions, the 18 standard CPI scales were listed, each followed by a description of persons seen as high and as low on the trait measured by the scale; these trait-descriptive adjectives were taken from the CPI Manual. The subjects predicted their peer ratings on each trait using a nine-point rating scale. The Predicted Peer Rating form is included in this report as Appendix E.

Both the 18 uncorrected (normative) ratings and 18 ipsative ratings were included in this study. The ipsative ratings were the standard scores on each trait for a single subject based upon the mean and standard deviation of his 18 ratings. Thus, the ipsative ratings reflect the subject's relative assessment of each trait compared to all 18 traits. The means and standard deviations of the normative ratings, and the correlations between the normative and ipsative ratings, are presented in Table 63. These correlations were quite consistent across the 18 traits, ranging from .77 to .87. Mean scores from the male and female samples were also quite similar, the sole exception being on Femininity, where females rated themselves almost two standard deviations higher than males.

Insert Table 63 about here

While not relevant to the interaction hypothesis, the reader may be interested in the relationships between the Predicted Peer Ratings and the 18 standard CPI scores. These correlations were computed in two ways: (a) across all subjects, separately for each scale, and (b) across the 18 scales, separately for each subject. The former set of correlations ranged from a high of .50 for Dominance to values close to zero for such traits as Psychological-Mindedness and Achievement via

Table 63

Means and Standard Deviations of the Predicted Peer Ratings, Plus the Correlations between Normative and Ipsative Ratings

Predicted Peer Ratings	Means				Standard Deviations				Correlations between Normative & Ipsative Ratings	
	Males		Females		Males		Females		Males	Females
	A	B	A	B	A	B	A	B		
P: Do	7	6	6	6	2	2	2	2	.83	.84
P: Cs	6	6	7	7	2	2	2	2	.81	.82
P: Sy	6	6	6	6	2	2	2	2	.82	.80
P: Sp	6	6	6	6	2	2	2	2	.82	.80
P: Sa	6	6	6	6	2	2	2	2	.81	.81
P: Wb	6	6	6	7	2	2	2	2	.81	.82
P: Re	7	7	7	7	2	2	2	2	.84	.86
P: So	6	6	7	7	2	2	2	2	.84	.82
P: Sc	6	5	6	6	2	2	2	2	.85	.85
P: To	6	7	7	7	2	2	2	2	.80	.78
P: Gi	6	7	7	7	2	2	2	2	.87	.85
P: Cm	6	6	6	6	2	2	2	2	.86	.87
P: Ac	6	6	7	7	2	2	2	2	.82	.80
P: Ai	6	6	6	6	2	2	2	2	.80	.81
P: Ie	7	6	7	7	2	2	2	2	.80	.77
P: Py	6	6	7	7	2	2	2	2	.84	.81
P: Fx	6	6	6	6	2	2	2	2	.86	.83
P: Fe	3	3	6	7	2	2	2	2	.84	.86
(N)	(168)	(170)	(178)	(219)					(353)	(419)

independence. The latter set of correlations showed a roughly normal distribution, with means of .19 and .10, and standard deviations of .26 and .28, for males and females respectively. These individual differences correlations, which ranged from a high of .84 to a low of -.64, have been correlated with other personality measures, and these correlations are available from the author.

Table 64 presents one significant interaction between a Predicted Peer Rating and the course satisfaction outcome variable. The correlations for both the normative and the ipsative ratings are included for comparison purposes. Note that a significant interaction for the normative ratings disappeared when ipsative scores were used.

Insert Table 64 about here

This same type of effect with the non-graded reading criterion is presented in Table 65. The normative values for three of the Predicted Peer Ratings produced significant interactions for male students, while the interactions based upon the ipsative ratings were generally not significant.

Insert Table 65 about here

Table 66 summarizes some interactions between two Predicted Peer Ratings and the course achievement criterion. Both normative and ipsative Predicted Peer Ratings of Sociability and Social Presence produced higher (negative) correlations with achievement in the Lecture than in the Self-study sections.

Insert Table 66 about here

Table 67 presents the significant interactions between Predicted Peer Ratings and the multiple-choice test score. For male students, Predicted Peer Ratings

Table 64

Correlations between Predicted Peer Ratings and the Course Satisfaction Outcome Variable in Different Teaching Conditions

(Male Students Only)

Predicted Peer Ratings		Course A		Course B		Z		Course A	Course B	Z
		L	S	L	S			L S	L S	
P: So	Q	.05	.28	.10	-.09	2.32*	Q	.15	.00	2.03*
(Normative)	P	-.05	-.45	.07	-.13		P	-.25	-.04	
P: So	Q	.01	.31	.09	-.02	1.68	Q	.14	.07	1.49
(Ipsative)	P	.03	-.26	.18	-.19		P	-.12	.00	
(N)	Q	(48)	(47)	(39)	(38)		Q	(95)	(77)	
	P	(41)	(34)	(51)	(42)		P	(75)	(93)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05

Table 65

Correlations between Predicted Peer Ratings and the Non-graded Reading Outcome Variable in Different Teaching Conditions

(Male Students Only)

Predicted Peer Ratings		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
P: Ie	Q	.17	.23	.45	.22	2.13*						
(Normative)	P	.28	-.17	.21	.12							
P: Ie	Q	.07	.24	.29	.16	.98						
(Ipsative)	P	.32	-.04	.19	.09							
P: Sa	Q	.37	-.24	.12	-.06	2.10*						
(Normative)	P	-.17	-.35	-.21	.19							
P: Sa	Q	.36	-.34	.06	-.11	1.59						
(Ipsative)	P	-.23	-.25	-.24	.18							
P: Do	Q	.20	-.12	-.05	.07	1.28	Q	.07		.00		2.12*
(Normative)	P	-.16	-.30	-.34	.04		P	-.24		-.16		
P: Do	Q	.23	-.14	-.16	.01	.70	Q	.06		-.08		2.07*
(Ipsative)	P	-.21	-.11	-.45	-.05		P	-.21		-.26		
(N)	Q	(48)	(47)	(39)	(38)		Q	(95)		(77)		
	P	(41)	(34)	(51)	(42)		P	(75)		(93)		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Inst uction

Q = Quiz Sections
P = Paper Sections

*$p < .05$

Table 66

Correlations between Predicted Peer Ratings and the Course Achievement Outcome Variable in Different Teaching Conditions

(Male Students Only)

Predicted Peer Ratings		Course A L	Course A S	Course B L	Course B S	Z	Course A L	Course A S	Course B L	Course B S	Z
P: Sy	Q	-.45	.00	-.46	-.05						
(Normative)	P	-.54	-.11	-.10	-.05	2.50*	-.50	-.06	-.23	-.08	2.90**
P: Sy	Q	-.48	.15	-.44	.06						
(Ipsative)	P	-.35	.07	-.11	-.08	2.99**	-.43	.09	-.24	-.03	3.44**
P: Sp	Q	-.58	-.21	-.48	-.02						
(Normative)	P	-.27	-.22	-.35	-.22	2.26*	-.42	-.21	-.40	-.15	2.31*
P: Sp	Q	-.56	-.15	-.53	.08						
(Ipsative)	P	-.04	-.11	-.33	-.28	2.50*	-.29	-.15	-.40	-.10	2.13*
(N)	Q	(48)	(47)	(39)	(38)						
	P	(41)	(34)	(51)	(42)		(89)	(81)	(90)	(80)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Insert Table 67 about here
----

of Responsibility and Intellectual Efficiency correlated positively with test scores in the Quiz, though not in the Paper, sections.

Finally, the significant interactions between Predicted Peer Ratings and the essay test score are presented in Table 68. Male students who predicted that others would see them as Feminine tended to make higher scores on the essay test in the Self-study condition, while no such effect was found in the Lecture condition.

Insert Table 68 about here

As has been pointed out repeatedly, all of the interactions tabled in this chapter could have resulted from chance, and further research is necessary to confirm their generality. To establish this point with more precision, let us consider the number of interaction effects to be expected by chance alone.

The Number of Obtained Significant Interactions vs. the Number Expected by Chance

The *post hoc* statistical test which was used in this chapter for deciding on the significance of an interaction effect is based on the assumption that each of the predictors is independent of the others. However, in the case of personality scales scored from one inventory (and even in the case of some of the scales scored from different inventories), the resulting scores are far from independent. Factor analyses of numerous inventories have rarely revealed more than 10 independent factors, and the usual number is closer to three or four. Consequently, it is not possible to provide any exact expectation of the number of interactions which would reach statistical significance by chance alone.

Table 67

Correlations between Predicted Peer Ratings
and the Multiple-choice Test Score
in Different Teaching Conditions
(Male Students Only)

Predicted Peer Ratings		Course A		Course B		Z		Course A	Course B	Z
		L	S	L	S			L S	L S	
P: Re	Q	.14	.09	.13	.09	1.49	Q	.12	.12	2.61**
(Normative)	P	-.25	-.10	-.17	-.12		P	-.17	-.17	
P: Re	Q	.36	.12	.08	.21	1.16	Q	.21	.14	1.49
(Ipsative)	P	.00	.09	-.02	-.01		P	.05	-.03	
P: Ie	Q	.06	.33	.40	.45	.88	Q	.21	.42	2.75**
(Normative)	P	.03	.06	-.05	.13		P	.04	.01	
P: Ie	Q	.24	.47	.38	.46	.40	Q	.37	.41	1.2[illegible]
(Ipsative)	P	.44	.29	.15	.21		P	.36	.18	
P: So	Q	.21	-.21	.09	-.17	1.92	Q	.00	-.08	2.16*
(Normative)	P	-.46	-.18	-.24	-.15		P	-.34	-.21	
P: So	Q	.36	-.29	-.02	-.18	1.13	Q	.07	-.13	.72
(Ipsative)	P	-.22	.10	-.11	-.11		P	-.09	-.13	
(N)	Q	(48)	(47)	(33)	(38)		Q	(95)	(77)	
	P	(41)	(34)	(51)	(42)		P	(75)	(93)	

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 68

Correlations between Predicted Peer Ratings and the Essay Test Score in Different Teaching Conditions

(Male Students Only)

Predicted Peer Ratings		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
P: Fe	Q	-.14	.32	-.20	-.23	2.87^{**}	-.01	.23	-.18	.19	2.76^{**}
(Normative)	P	.08	.08	-.12	.48						
P: Fe	Q	-.08	.23	-.11	-.21	1.98^{*}	-.03	.19	-.12	.10	1.99^{*}
(Ipsative)	P	-.01	.12	-.09	.33						
P: Gi	Q	-.09	-.21	.11	-.14	2.20^{*}	-.10	-.25	.00	-.27	1.99^{*}
(Normative)	P	-.12	-.34	-.06	-.34						
P: Gi	Q	-.09	-.40	.13	-.14	2.13^{*}	-.07	-.36	-.03	-.25	2.44^{*}
(Ipsative)	P	-.07	-.30	-.12	-.34						
P: To	Q	.15	-.05	.22	.05	2.62^{**}	.11	-.21	.08	-.01	1.86
(Normative)	P	.10	-.42	-.04	-.04						
P: To	Q	.13	-.12	.19	.01	1.62	.10	-.19	.08	.07	1.36
(Ipsative)	P	.12	-.30	-.01	.10						
(N)	Q	(48)	(47)	(39)	(38)		(89)	(81)	(90)	(80)	
	P	(41)	(34)	(51)	(42)						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$
$^{**}p < .01$

Nonetheless, since the three major outcome variables (the course satisfaction, course achievement, and non-graded reading factor scores) were completely independent, it was possible to compare the number of significant interactions obtained using these three criteria with the number obtained when three sets of random normal deviates were used instead. The results of one of these comparisons is presented in Table 69. In this table the frequency of significant interaction effects for the 49 CPI scales and the three orthogonal criteria are compared to the frequency obtained for the same scales with the random normal deviates. If the number of significant effects in the "Total" column in the middle of Table 69 were sizable relative to that of the "Total" column on the right hand side of the table, then the reader might expect that most of the interactions found in this study would replicate in other contexts.

Insert Table 69 about here

However, as one can see from Table 69, such is not the case. For this particular set of random normal deviates, the ratio of obtained significant interactions to that expected by chance was only four to three. While there were sets of random deviates which produced correlational patterns more encouraging to the interaction hypothesis, the tabled correlations were selected to insure that the reader not put any misplaced faith in the empirical results obtained in this study. Since Table 69 demonstrates that a substantial number of the significant interactions presented in this chapter could have arisen by chance alone, the reader must again be cautioned against accepting these findings before they have been replicated. The present findings should be considered only as clues or hypotheses to guide future investigators to the most promising potential inter-

Table 69

A Comparison of the Frequency of Significant Interaction Effects for 49 CPI Scales between (a) Three Actual (Orthogonal) Criteria and (b) Three Random Normal Deviates

	Average Correlational Differences	Actual Criteria				Random Variables			
LQ vs. SP		SAT	ACH	NGR	Total	1	2	3	Total
Total	.25 - .29	0	0	2	2	0	0	0	0
	.20 - .24	2	1	1	4	0	1	0	1
Males	.45 - .49	0	0	0	0	1	0	0	1
	.40 - .44	0	0	0	0	0	1	0	1
	.35 - .39	0	1	1	2	1	1	0	2
	.30 - .34	0	1	1	2	3	4	0	7
	.25 - .29	1	1	4	6	2	6	1	9
Females	.30 - .34	0	1	2	3	0	0	2	2
	.25 - .29	3	1	5	9	0	0	0	0
Q vs. P									
Males	.30 - .34	1	0	0	1	0	1	0	1
	.25 - .29	1	0	0	1	1	0	0	1
	.20 - .24	4	2	0	6	1	0	0	1
Females	.25 - .29	2	0	0	2	0	0	0	0
	.20 - .24	4	1	1	6	0	1	0	1
L vs. S									
Males	.35 - .39	0	0	0	0	0	1	0	1
	.30 - .34	0	1	0	1	0	1	0	1
	.25 - .29	0	0	0	0	0	1	0	1
	.20 - .24	0	1	1	2	2	4	0	6
Females	.30 - .34	0	0	0	0	0	1	0	1
	.25 - .29	0	0	0	0	0	1	1	2
	.20 - .24	4	2	8	14	1	2	3	6

Note: -- The cell entries are frequencies of significant interaction effects. The strength of these effects is indicated by the size of the corresponding correlational difference: the algebraic difference in correlation between each treatment (e.g., LQ vs. SP) within each course, averaged across the two courses. The initial correlations involved each of the 49 CPI scales (Table 16) either with one of the three outcome factor scores--Course Satisfaction (SAT), Course Achievement (ACH), and Non-graded Reading (NGR)--or with one of the three random normal deviates.

action variables. If scales which produced significant interaction effects in the present study are later found to produce the same effects in other courses, then the task of imbedding such variables in a theory of college instruction might profitably begin.

A Summary of the Most Significant Interaction Effects

As an aid to future investigators, the findings presented in Tables 11 to 68 have been recast in summary form. Tables 70 to 74 present the most significant interaction effects for each of the five criterion variables in turn, separately for male and for female students. Since it is unlikely that others will utilize the same four-fold experimental design used in the present project, the summary tables focus solely on the two major experimental comparisons, namely between the Quiz (Q) vs. Paper (P) and between the Lecture (L) vs. Self-study (S) treatments. Consequently, investigators who wish to explore only one of these dimensions of college instruction can find the most promising personality measures among those listed in the following tables. Interactions which occurred at levels of significance close to the .05 level are typically not included in these summary tables.

Table 70 summarizes the significant interactions between personality scales and the course satisfaction outcome variable. For this criterion, there were roughly three times as many interactions involving the Quiz vs. Paper comparison as the Lecture vs. Self-study one, and roughly three times as many significant interactions found for females as for males. Consequently, if a future investigator's focus is on student satisfaction, he might study female students randomly assigned to Quiz and Paper teaching conditions. In such a case, a number of scales from the EPPS, SVIB, ACL, MMPI, and CPI are promising candidates for inclusion in a personality test battery.

Insert Table 70 about here

Table 70

Significant Interactions with the Course Satisfaction Outcome Variable: Summary Table

Male Students		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Extroversion (Residual) (RBI)	Q	.30	.11	.16	.06	3.18**	Q		.20		.10	2.58**
	P	-.06	-.34	.05	-.20		P		-.19		-.07	
Lack of Protection (CPRI)	Q	-.51	-.25	-.07	.00	2.01*	Q		-.38		.00	2.60**
	P	.25	.00	.06	.04		P		.11		.07	
Femininity (CPI)	Q	-.19	.20	.03	-.07	1.52	Q		-.01		-.03	2.33*
	P	.32	.23	.30	.12		P		.26		.22	
Altruism (Residual) (RBI)	Q	-.30	-.13	-.28	-.24	1.78	Q		-.20		-.26	2.21*
	P	-.18	.21	.22	-.24		P		.00		.01	
nUnderstanding (CPI)	Q	-.07	-.07	.15	-.02	1.19	Q		-.07		.09	2.20*
	P	.24	.07	.33	.39		P		.15		.35	
Ruled-Complex (WFPT)	Q	.02	-.15	.00	.12	1.19	Q		-.07		.08	2.12*
	P	-.37	-.08	-.24	-.27		P		-.21		-.24	
Predicted Peer Ratings: Socialization	Q	.05	.28	.10	-.09	2.32*	Q		.15		.00	2.03*
	P	-.05	-.45	.07	-.13		P		-.25		-.04	
Factor R (MMPI)	Q	-.09	.34	-.15	.20	1.66		.00	.17	-.13	.26	2.51*
	P	.13	-.02	-.07	.32							
HOSTILITY (MMPI)	Q	.00	-.28	-.01	-.09	.81		.05	-.11	.14	-.18	2.11*
	P	.11	.03	.18	-.30							

Table 70
Page Two

Female Students		Course A L	Course A S	Course B L	Course B S	Z		Course A	Course B	Z
Exhibition	Q	.07	.33	.00	.27	.32	Q	.18	.15	2.94^{**}
(EPPS)	P	-.25	-.07	-.33	.05		P	-.16	-.11	
Law-Politics	Q	-.08	.04	-.06	.27	1.68	Q	-.03	.11	2.79^{**}
(SVIB)	P	-.18	-.45	-.08	-.12		P	-.36	-.10	
Artist	Q	.02	-.27	.06	.02	1.42	Q	-.10	.05	2.69^{**}
(SVIB)	P	.29	.21	.18	.25		P	.26	.22	
Exhibition	Q	-.02	.18	-.05	.15	.95	Q	.05	.05	2.66^{**}
(ACL)	P	-.24	-.41	-.27	.11		P	-.36	-.05	
College Achievement	Q	-.23	.02	.19	-.17	1.32	Q	-.16	.00	2.59^{**}
(MMPI)	P	.24	.23	.21	.10		P	.24	.13	
nAffiliation	Q	.02	.40	.03	-.07	1.44	Q	.16	-.02	2.52^{*}
(CPI)	P	-.22	-.19	-.20	-.16		P	-.21	-.17	
Architect	Q	.00	-.25	.02	-.02	1.72	Q	-.10	.02	2.49^{*}
(SVIB)	P	.27	.20	.02	.28		P	.24	.18	
Aggression	Q	.05	-.25	-.25	.39	1.12	Q	-.06	.10	2.45^{*}
(EPPS)	P	-.33	-.25	-.09	-.25		P	-.28	-.17	
fExtra-version	Q	-.04	.30	.14	.16	.43	Q	.08	.15	2.43^{*}
(CPI)	P	-.08	-.21	-.42	.09		P	-.18	-.09	
Ruled-Freehand	Q	.12	-.13	-.30	.09	2.10^{*}	Q	.02	-.09	2.40^{*}
(WFPT)	P	-.16	-.42	-.08	-.30		P	-.34	-.20	
Acquiescence II	Q	.15	.18	.22	.11	1.29	Q	.16	.16	2.37^{*}
(BSAS)	P	-.38	-.01	.02	.03		P	-.17	.02	

Table 70
Page Three

Female Students		Course A		Course B		Z		Course A	Course B	Z
		L	S	L	S			L S	L S	
Hetero-sexuality (ACL)	Q	.23	.11	.13	-.11	2.08*	Q	.18	-.01	2.36*
	P	-.11	-.26	-.33	.06		P	-.21	-.09	
Need for Achievement (CPRI)	Q	.05	.15	.05	.07	1.52	Q	.09	.08	2.36*
	P	-.20	-.23	-.17	-.09		P	-.19	-.12	
Dominance (ACL)	Q	-.01	.01	.07	.09	1.02	Q	.00	.07	2.36*
	P	-.21	-.27	-.38	.06		P	-.28	-.11	
Dentist (SVIB)	Q	-.06	-.15	.05	-.14	1.20	Q	-.10	-.05	2.34*
	P	.18	.04	.12	.27		P	.11	.21	
Abasement (ACL)	Q	-.02	-.05	-.04	-.10	.95	Q	-.03	-.07	2.31*
	P	.09	.26	.39	-.07		P	.23	.13	
Factor R (MMPI)	Q	-.11	-.14	.24	-.01	1.32	Q	-.12	.12	2.29*
	P	.26	.43	.10	.04		P	.39	.06	
Overt Hostility (MMPI)	Q	-.02	.10	-.12	.24	.61	Q	.02	.08	2.29*
	P	-.16	-.27	-.25	-.03		P	-.25	-.11	
Rehab. Counselor (SVIB)	Q	.20	.25	.07	.22	1.82	Q	.22	.13	2.24*
	P	.01	-.04	.11	-.19		P	-.02	-.08	
Shading (WFPT)	Q	.09	-.04	-.27	.17	1.22	Q	.04	-.01	2.20*
	P	-.07	-.31	-.24	-.20		P	-.20	-.21	
Maturity (RBI)	Q	.06	-.06	.11	-.01	2.09*	Q	.01	.03	2.15*
	P	-.10	-.28	-.10	-.11		P	-.27	-.11	

Table 70
Page Four

Female Students		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
Printer	Q	.00	-.30	.33	-.08	1.72	.09	-.07	.27	-.13	2.84**
(SVIB)	P	.18	.06	.21	-.19						
Social Presence	Q	-.13	.10	.06	.04	.93	-.14	.03	-.23	.10	2.44*
(MMPI)	P	.00	-.01	-.44	.20						
Music Teacher	Q	.20	-.18	.18	-.07	.95	.19	-.03	.25	.01	2.34*
(SVIB)	P	.16	.07	.30	.05						
Dominance	Q	-.14	.05	-.17	.12	.40	-.28	-.06	-.24	-.01	2.25*
(EPPS)	P	-.41	-.13	-.32	-.07						
Introversion	Q	.09	-.21	-.08	.05	.75	.12	-.09	.19	-.06	2.24*
(MMPI)	P	.11	-.02	.44	-.18						
nInfravoidance	Q	.08	-.18	.01	-.12	.90	.09	-.05	.14	-.17	2.21*
(CPI)	P	.06	.04	.24	-.20						
Achievement (Ach)	Q	-.08	.16	-.01	.12	2.09*	-.01	.17	-.01	.24	2.11*
(CPI)	P	.22	.16	-.05	.32						
Adjustment	Q	.27	-.27	.28	-.22	2.12*	.19	-.06	-.01	-.16	2.02*
(ACL)	P	-.08	.06	-.19	-.07						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*$p < .05$
**$p < .01$

Table 71 summarizes the most significant interactions with the course achievement outcome variable. In contrast to course satisfaction, significant interactions with course achievement were about equally prevalent for male and for female students, and there were approximately three times as many significant interactions involving the Lecture vs. Self-study comparison as the Quiz vs. Paper one. Consequently, future studies of interactions with course achievement might well focus upon the Lecture vs. Self-study treatment conditions and utilize some of the scales listed in Table 71.

Insert Table 71 about here

Table 72 summarizes the significant interactions with the non-graded reading outcome variable. While extracurricular reading has not been used as a criterion variable in previous studies of college instruction, this outcome variable may be particularly relevant to investigators interested in the general effects of college instruction. Since many instructors attempt to encourage such extracurricular reading (on the grounds that it helps provide the basis for a richer understanding of course material), future investigators might consider the use of such a criterion variable whenever it is feasible to do so. Results from the present study suggest that personality scale interactions with this outcome variable were found more often for female than for male students, and more often for the Lecture vs. Self-study teaching comparison than for the Quiz vs. Paper one. A number of scales from the SVIB, MMPI, RBI, and CPI might prove useful in future investigations.

Insert Table 72 about here

Table 71

Significant Interactions with the Course Achievement Outcome Variable: Summary Table

Male Students		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
P. Peer Rat.: Sociability (Ipsative)	Q	-.48	.15	-.44	.06	2.99^{**}	-.43	.09	-.24	-.03	3.44^{**}
	P	-.35	.07	-.11	-.08						
Femininity (CPI)	Q	.06	.40	-.16	.07	2.38^{*}	-.05	.34	-.08	.20	3.01^{**}
	P	-.19	.37	-.04	.30						
Assertiveness (RBI)	Q	-.27	.01	-.31	.42	1.03	-.26	-.06	-.28	.16	3.06^{**}
	P	-.24	-.14	-.24	-.13						
Extroversion (RBI)	Q	-.51	-.10	-.39	.19	1.65	-.38	-.17	-.33	.04	2.82^{**}
	P	-.28	-.32	-.27	-.11						
Affiliation (RBI)	Q	-.34	-.03	-.40	.15	1.34	-.27	-.03	-.31	-.03	2.50^{*}
	P	-.27	-.10	-.23	-.24						
Sociability (RBI)	Q	-.43	-.09	-.14	.20	1.15	-.31	-.08	-.23	.05	2.50^{*}
	P	-.22	-.12	-.29	-.11						
Policeman (SVIB)	Q	-.20	-.41	.07	-.38	1.67	-.17	-.40	-.06	-.32	2.41^{*}
	P	-.36	-.41	-.15	-.23						
Achievement (EPPS)	Q	.04	.37	.05	.29	1.38	.01	.37	.04	.19	2.39^{*}
	P	.04	.45	.01	.06						
Predicted Peer Ratings: So. Presence	Q	-.58	-.21	-.48	-.02	2.26^{*}	-.42	-.21	-.40	-.15	2.31^{*}
	P	-.27	-.22	-.35	-.22						

Table 71
Page Two

Male Students		Course A L	Course A S	Course B L	Course B S	Z		Course A	Course B	Z
Foibles (Residual) (RBI)	Q	-.01	-.19	-.04	-.29		Q	-.10	-.17	
	P	.28	.10	.13	.24	1.21	P	.20	.16	2.90^{**}
Forced-Choice F-Scale (CCPI)	Q	.07	-.05	-.02	-.20		Q	.00	-.13	
	P	-.46	-.06	-.26	-.45	1.78	P	-.27	-.35	2.33^{*}
Femininity (MMPI)	Q	.32	.41	.18	.08		Q	.37	.12	
		.01	.32	-.30	-.03	.63	P	.14	-.15	2.29^{*}
Female Students										
Achievement Values (CPRI)	Q	.22	.18	.29	.45		Q	.20	.37	
	P	.10	-.14	-.04	-.01	2.42^{*}	P	-.05	-.03	3.30^{**}
Affiliation (EPPS)	Q	.02	-.34	-.21	-.27		Q	-.13	-.21	
	P	.14	.10	.28	.04	1.19	P	.10	.16	2.94^{**}
Social Values (CCPI)	Q	-.03	-.15	-.27	-.24		Q	-.03	-.26	
	P	-.05	.24	.07	.05	2.14^{*}	P	.14	.06	2.43^{*}

Table 71
Page Three

Female Students		Course A L	Course A S	Course B L	Course B S	Z	Course A L	Course A S	Course B L	Course B S	Z
Agriculture	Q	-.28	.27	-.27	-.01	2.59**	-.28	.18	-.18	.00	3.23**
(SVIB)	P	-.05	.12	-.14	.02						
Nature	Q	-.11	.21	-.17	.23	3.03**	-.10	.24	-.06	.23	3.13**
(SVIB)	P	.13	.26	-.03	.27						
Mechanical	Q	-.11	.20	-.22	-.13	1.50	-.09	.12	-.30	.07	2.94**
(SVIB)	P	.08	.08	-.38	.00						
Forest Service Man	Q	-.11	.07	-.31	-.07	1.79	-.17	.04	-.35	-.02	2.79**
(SVIB)	P	-.03	.02	-.38	.04						
Emotional Immaturity	Q	-.19	.36	.01	.14	1.07	-.18	.26	-.09	.03	2.78**
(MMPI)	P	-.15	.19	-.12	-.07						
Physical Therapist	Q	-.18	.21	-.30	-.06	1.86	-.16	.11	-.30	-.05	2.64**
(SVIB)	P	-.06	.05	-.35	-.03						
Factor P	Q	-.06	.26	-.22	.10	1.82	-.07	.20	-.17	.07	2.49*
(MMPI)	P	-.03	.17	-.13	.06						
Veterinarian	Q	-.30	.14	-.12	-.33	1.35	-.30	.06	-.30	-.18	2.49*
(SVIB)	P	-.17	.01	-.40	-.07						
Factor _R_	Q	.29	-.14	.37	.13	2.50*	.33	-.07	.15	.06	2.44*
(MMPI)	P	.37	-.03	-.02	.02						
nUnderstanding	Q	.05	.22	-.04	.24	1.62	-.01	.24	-.02	.21	2.35*
(CPI)	P	-.12	.25	-.02	.21						
Dependency	Q	-.24	.12	-.24	.12	2.00*	-.18	.10	-.11	.05	2.15*
(MMPI)	P	-.17	.09	.00	-.01						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

$^{*}p < .05$
$^{**}p < .01$

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

Table 72

Significant Interactions with the Non-graded Reading Outcome Variable: Summary Table

Total Sample		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Acquiescence Response Bias	Q	.02	-.10	.14	-.24	2.67^{**}		-.02	-.19	.13	-.17	3.11^{**}
(MMPI)	P	-.07	-.27	.12	-.12							
nPlay	Q	.03	-.17	.10	-.37	2.57^{*}		-.02	-.20	-.12	-.27	2.33^{*}
(CPI)	P	-.09	-.22	-.25	-.19							
Originality	Q	.16	.04	-.10	.02	2.86^{**}		.12	.23	-.08	.14	2.19^{*}
(MMPI)	P	.05	.40	-.07	.24							
Male Students												
PHOBIAS	Q	-.41	.08	-.17	-.33	1.23	Q	-.23		-.24		2.69^{**}
(MMPI)	P	.02	-.20	.36	.00		P	-.07		.21		
Psycholog.-Mindedness	Q	.18	.17	.37	.03	2.08^{*}	Q	.18		.24		2.25^{*}
(MMPI)	P	.11	.00	-.19	-.12		P	.06		-.15		
Predicted Peer Ratings	Q	.20	-.12	-.05	.07	1.28	Q	.07		.00		2.12^{*}
Dominance	P	-.16	-.30	-.34	.04		P	-.24		-.16		
Psychasthenia	Q	-.26	-.10	-.10	-.26	.93	Q	-.20		-.18		2.11^{*}
(MMPI)	P	.01	.05	.20	-.11		P	.03		.07		
Psychoneurosis	Q	-.31	-.13	-.05	-.28	.42	Q	-.24		-.17		2.11^{*}
(MMPI)	P	.03	-.04	.26	-.19		P	.00		.07		
Abasement	Q	-.37	-.29	-.21	.07	.43	Q	-.34		-.08		2.10^{*}
(EPPS)	P	.22	-.34	.24	-.11		P	-.04		.08		

Table 72
Page Two

Male Students		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Nature	Q	.45	.02	.16	.03	1.89		.28	-.08	.19	.04	2.41*
(SVIB)	P	.05	-.05	.24	.08							
Intraception	Q	.26	.00	.05	-.19	1.31		.23	-.10	.11	-.05	2.21*
(EPPS)	P	.21	-.22	.15	.11							
Status (Residual)	Q	-.20	.18	-.06	-.04	1.96*		-.21	.19	-.03	.04	2.18*
(RBI)	P	-.21	.21	-.04	.16							
Female Students												
Autonomy	Q	.17	.20	.03	.13	1.40	Q	.18		.07		2.45*
(EPPS)	P	-.28	-.08	-.07	-.11		P	-.15		-.10		
Hetero-sexuality	Q	-.05	.37	.25	.02	.97	Q	.13		.16		2.30*
(EPPS)	P	-.17	-.09	-.09	.03		P	-.14		-.04		
Originality	Q	.17	.38	.23	.12	1.19	Q	.26		.17		2.27*
(CPRI)	P	-.25	.13	.00	-.06		P	.00		-.03		
SAT-V	Q	.22	.62	.44	.35	1.25	Q	.39		.40		2.20*
	P	.22	.12	.19	.20		P	.16		.20		
Lie	Q	-.10	-.16	-.20	.08	2.14*	Q	-.14		-.04		2.20*
(MMPI)	P	.29	.14	-.04	.16		P	.19		.08		
GPA	Q	.12	.10	.37	.23	1.83	Q	.14		.28		1.96*
	P	-.02	-.07	.07	.04		P	-.04		.05		

Table 72
Page Three

Female Students		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
Military	Q	.20	-.18	.20	-.16	2.19*	.15	-.20	.23	-.10	3.38**
(SVIB)	P	.11	-.17	.22	-.03						
Acquiescence Response Bias	Q	.07	-.08	.12	-.21	2.46*	.05	-.25	.20	-.16	3.27**
(MMPI)	P	.02	-.36	.25	-.12						
Assertiveness (Residual)	Q	-.04	.40	-.01	.15	.81	-.10	.25	-.11	.11	2.90**
(RBI)	P	-.18	.10	-.21	.07						
Army Officer	Q	.28	-.25	.02	-.10	2.15*	.22	-.18	.03	-.09	2.59**
(SVIB)	P	.10	-.19	.01	-.09						
Librarian	Q	-.15	.10	-.02	.25	2.23*	-.14	.17	.02	.23	2.59**
(SVIB)	P	-.12	.22	.00	.22						
Endurance	Q	-.02	.09	-.13	.26	2.45*	.06	.17	-.12	.28	2.55*
(EPPS)	P	.20	.21	-.06	.31						
Ach. via Independence	Q	.15	.24	-.13	.12	2.19*	.07	.41	.00	.11	2.35*
(CPI)	P	-.06	.48	-.03	.11						
fNeuroticism	Q	.14	.06	-.33	.16	2.19*	.14	.24	-.25	.12	2.35*
(CPI)	P	.18	.30	-.18	.10						
Psycholog.-Mindedness	Q	.19	.08	-.20	.05	1.91	.05	.30	-.14	.08	2.35*
(CPI)	P	-.18	.40	-.17	.10						
Air Force Officer	Q	.29	-.08	.06	-.07	1.75	.24	-.05	.10	-.08	2.34*
(SVIB)	P	.13	-.03	.12	-.09						
Affiliation (Residual)	Q	.12	-.04	.20	-.02	2.05*	.09	-.14	.18	-.05	2.30*
(RBI)	P	.07	-.16	.18	-.08						

Table 72
Page Four

Female Students		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
Originality	Q	.23	.05	.04	-.01	1.96*	.08	.31	-.04	.18	2.24*
(MMPI)	P	-.17	.50	-.15	.35						
Tolerance	Q	.10	.06	-.26	.21	2.05*	.09	.24	-.16	.13	2.16*
(CPI)	P	.08	.30	-.12	.09						
Intellectual Efficiency	Q	.20	.23	-.24	.26	1.58	.10	.31	-.09	.13	2.16*
(CPI)	P	-.13	.33	-.04	.06						
fSurgency	Q	-.06	-.10	.00	-.27	2.63**	-.13	-.30	-.03	-.27	2.11*
(CPI)	P	-.28	-.48	.03	-.26						
Responsibility	Q	.06	.19	-.25	.27	1.98*	.08	.22	-.12	.17	2.11*
(CPI)	P	.11	.24	-.07	.11						
Liberal-Conservatism	Q	-.11	.15	-.06	.22	1.24	-.08	.14	-.05	.15	2.09*
(SVIB)	P	-.03	.08	-.04	.09						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

As discussed earlier, interactions with the multiple-choice test score were generally similar in pattern and in magnitude to those for the course achievement factor score. Table 73 summarizes some significant interactions with the multiple-choice test scores for a few indices which manifested differences between those two criteria. Future investigators who intend to confine their measures of academic achievement to multiple-choice tests might consider including a few of the scales listed in Table 73, in addition to those listed in Table 71. The mathematics subscore of the Scholastic Aptitude Test, for example, is a measure which is both commonly available and which produced a statistically significant interaction effect in the present study.

Insert Table 73 about here

Interestingly, the outcome variable which produced the most significant interactions was the essay test score. Table 74 summarizes a number of these effects. Interactions with the essay test score were approximately equally prevalent in the male and female samples, and in both the Quiz vs. Paper and the Lecture vs. Self-study comparisons. A number of CPI scales were implicated in these interactions, as well as some from the MMPI and other inventories.

Insert Table 74 about here

In summary, then, for each of these five criteria and each of these two major variations in experimental teaching conditions, some 300-400 _a priori_ personality scales produced a few dozen significant interaction effects. All of these interactions _could_ have arisen by chance alone, and none of them were truly large in magnitude. While a few of the average correlational differences between the most structured (LQ) and the least structured (SP) sections of each course were above

Table 73

Significant Interactions with the Multiple-Choice Test Score:

Summary Table

		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Total Sample												
SAT-M	Q	.20	.28	.18	.31	2.23*		.18	.38	.16	.31	2.44*
	P	.16	.50	.13	.31							
Male Students												
SAT-M	Q	.26	.48	.21	.58	.88		.22	.45	.16	.44	2.42*
	P	.24	.39	.10	.36							
Black (Residual) (WFPT)	Q	.33	.02	.27	-.07	2.64**		.24	-.10	.06	-.05	2.08*
	P	.21	-.20	-.14	-.02							
Predicted Peer Ratings: Int. Eff.	Q	.06	.33	.40	.45	.88	Q	.21		.42		2.75**
	P	.03	.06	-.05	.13		P	.04		.01		
Predicted Peer Ratings: Responsib.	Q	.14	.09	.13	.09	1.49	Q	.12		.12		2.61**
	P	-.25	-.10	-.17	-.12		P	-.17		-.17		
Predicted Peer Ratings: Socializat.	Q	.21	-.21	.09	-.17	1.92	Q	.00		-.08		2.16*
	P	-.46	-.18	-.24	-.15		P	-.34		-.21		

Table 73
Page Two

Female Students		Course A L	Course A S	Course B L	Course B S	Z	Course A L	Course A S	Course B L	Course B S	Z
Sales Manager (SVIB)	Q	-.08	-.43	.14	-.22	2.30*	-.10	-.37	.09	-.22	2.99**
	P	-.18	-.35	.06	-.20						
Nature (SVIB)	Q	-.03	.21	-.11	.31	2.26*	-.08	.23	.01	.26	2.84**
	P	-.02	.25	.08	.22						
Osteopath (SVIB)	Q	-.09	.21	-.07	.00	1.82	-.11	.25	-.11	.03	2.54*
	P	-.08	.29	-.14	.04						
Life Ins. Salesman (SVIB)	Q	.04	-.24	.20	-.04	2.37*	-.08	-.27	.21	-.09	2.49*
	P	-.35	-.29	.23	-.11						
Agriculture (SVIB)	Q	-.21	.21	-.18	.16	1.53	-.20	.13	-.10	.05	2.39*
	P	-.03	.07	-.05	-.04						
Music (SVIB)	Q	.02	.09	-.29	.13	2.96**	.11	.22	-.12	.20	2.14*
	P	.26	.29	-.01	.23						
Purchasing Agent (SVIB)	Q	-.25	-.31	-.05	-.42	1.93	-.20	-.43	-.16	-.32	2.14*
	P	-.19	-.51	-.23	-.27						
Architect (SVIB)	Q	.01	-.02	.18	-.14	1.50	Q -.01		-.02		2.84**
	P	.31	.43	.17	.14		P .39		.13		
Social Sci. Teacher (SVIB)	Q	-.34	-.45	-.07	.26	2.45*	Q -.05		.11		2.74**
	P	-.07	.32	-.11	-.08		P -.40		-.07		
Dotted Line (Residual) (WFPT)	Q	.02	.36	.38	.23	1.44	Q .15		.28		2.40*
	P	-.01	-.24	-.11	.26		P -.14		.10		

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

*p < .05
**p < .01

Table 74

Significant Interactions with the Essay Test Score: Summary Table

Male Students		Course A L	Course A S	Course B L	Course B S	Z	Course A L	Course A S	Course B L	Course B S	Z
fHarmonious Childhood (CPI)	Q	-.13	.42	-.10	.04	1.93	-.15	.37	-.13	.07	3.27**
	P	-.20	.28	-.15	.13						
Responsibility (Re) (CPI)	Q	-.24	.35	-.11	.22	2.44*	-.08	.32	-.06	.18	2.88**
	P	.04	.28	-.01	.18						
Responsibility (Res) (CPI)	Q	-.28	.30	-.10	.19	2.32*	-.23	.24	.02	.18	2.79**
	P	-.22	.19	.11	.20						
Predicted Peer Ratings: Femininity	Q	-.14	.32	-.20	-.23	2.87**	-.01	.23	-.18	.19	2.76**
	P	.08	.08	-.12	.48						
Responsibility (MMPI)	Q	-.18	.42	.10	.00	1.48	-.16	.37	.04	.08	2.60**
	P	-.16	.25	.05	.15						
Femininity (Fe) (CPI)	Q	-.12	.30	-.13	.02	3.30**	.01	.34	.02	.25	2.57*
	P	.12	.40	.11	.41						
Endurance (EPPS)	Q	-.04	.07	-.01	.27	1.44	-.13	.14	-.06	.22	2.48*
	P	-.26	.27	-.07	.14						
Pred. Peer Ratings: Gi (Ipsative)	Q	-.09	-.40	.13	-.14	2.13*	-.07	-.36	-.03	-.25	2.44*
	P	-.07	-.30	-.12	-.34						
Femininity (Fem) (CPI)	Q	.04	.56	-.12	-.12	1.58	.06	.48	-.08	.01	2.43*
	P	.07	.35	-.05	.08						

Table 74
Page Two

Male Students		Course A		Course B		Z		Course A		Course B		Z
		L	S	L	S			L	S	L	S	
Delinquency	Q	.27	-.43	.01	-.02	1.66		.19	-.27	-.03	-.11	2.42*
(MMPI)	P	.18	.01	-.08	-.26							
fSurgency	Q	-.05	-.18	.20	-.10	1.96*		.01	-.18	.11	-.24	2.39*
(CPI)	P	.09	-.18	.03	-.32							
Hypomania	Q	-.08	-.29	-.21	-.15	.51		.13	-.26	-.08	-.21	2.33*
(MMPI)	P	.26	-.17	-.04	-.28							
Exhibition	Q	-.13	-.07	-.07	-.31	1.16		.01	-.13	.04	-.31	2.25*
(EPPS)	P	.21	-.26	.12	-.30							
Value Orientation	Q	.03	.45	.02	.05	.62		-.05	.33	.01	.11	2.17*
(CPI)	P	-.15	.08	.02	.18							
Self-Control	Q	.17	.37	-.07	-.02	.48		.00	.27	-.05	.12	1.99*
(CPI)	P	-.19	.04	-.02	.22							
Overt Hostility	Q	-.09	-.24	-.32	-.09	.57	Q	-.18		-.21		2.60**
(MMPI)	P	.32	-.09	.02	-.14		P	.17		-.03		
GPA	Q	.11	.32	.06	-.12	2.59**	Q	.23		.00		2.46*
	P	.43	.59	.15	.38		P	.47		.29		
Impulsivity	Q	-.14	-.33	-.05	-.15	.18	Q	-.26		-.11		2.38*
(MMPI)	P	.33	.05	.00	-.18		P	.22		-.06		
Deference	Q	.09	-.03	.23	.18	1.35	Q	.02		.21		2.19*
(EPPS)	P	-.31	-.19	-.08	.07		P	-.26		.01		
Psychologist	Q	.08	.12	.29	-.13	.87	Q	.08		.06		2.17*
(SVIB)	P	.28	.30	.26	.34		P	.29		.30		

Table 74
Page Three

Female Students		Course A		Course B		Z		Course A	Course B	Z
		L	S	L	S			L S	L S	
Affiliation	Q	-.31	-.18	-.07	-.24	1.87	Q	-.25	-.12	3.38**
(EPPS)	P	.14	.13	.34	.01		P	.14	.17	
Psycholog.-Mindedness	Q	.21	.28	.47	.21	2.66**	Q	.22	.32	3.25**
(CPI)	P	-.23	-.10	-.01	.08		P	-.15	.03	
Altruism	Q	-.16	.28	-.17	.03	3.04**	Q	.01	-.10	2.60**
(RBI)	P	.00	.33	.32	.16		P	.19	.24	
Lability (Residual)	Q	.23	-.16	.05	.18	1.46	Q	.12	.16	2.36*
(ACL)	P	-.20	-.08	-.05	-.04		P	-.14	-.05	
Nurturance	Q	-.17	.09	-.34	-.26	2.05*	Q	-.08	-.26	2.35*
(EPPS)	P	.00	.04	.20	.01		P	.03	.10	
fNeuroticism	Q	.01	.24	.24	.20	1.04	Q	.10	.19	2.33*
(CPI)	P	-.23	-.20	-.07	.16		P	-.21	.02	
Medical Science	Q	-.22	.15	.15	-.07	2.26*	Q	-.08	.06	2.29*
(SVIB)	P	.19	.37	.11	.16		P	.30	.13	
Exhibition	Q	-.23	-.19	-.25	-.01	2.23*	Q	-.22	-.13	2.20*
(RBI)	P	-.07	.23	.07	-.11		P	.12	-.03	
Psycholog.-Mindedness	Q	.28	.02	.37	.17	2.68**	Q	.17	.22	2.05*
(MMPI)	P	.19	-.09	-.04	.02		P	.00	-.03	
Sociability	Q	.00	.06	-.37	.02	2.16*	Q	.02	-.18	2.05*
(RBI)	P	.15	.21	.17	-.01		P	.18	.07	

Table 74
Page Four

Female Students		Course A		Course B		Z	Course A		Course B		Z
		L	S	L	S		L	S	L	S	
Activity (Residual) (RBI)	Q	.04	-.10	.42	-.16	2.78^{**}	.10	-.07	.24	-.13	2.70^{**}
	P	.22	-.09	.11	-.18						
Impulsivity (MMPI)	Q	-.15	.18	-.37	.03	2.39^{*}	-.14	.19	-.20	-.03	2.44^{*}
	P	-.14	.20	-.05	-.07						
Deference (Residual) (ACL)	Q	.20	-.23	-.24	-.23	.29	.24	-.18	-.04	-.10	2.42^{*}
	P	.28	-.14	.09	.02						
Rev. Art Scale (WFPT)	Q	-.15	.09	.11	.13	1.85	-.07	.18	-.03	.20	2.40^{*}
	P	.05	.22	-.17	.24						
Aggression (Residual) (ACL)	Q	-.11	.11	.25	.28	.04	-.20	.12	.00	.14	2.32^{*}
	P	-.33	.13	-.16	.01						
Autonomy (Residual) (ACL)	Q	-.14	.19	.20	.31	.04	-.18	.12	.00	.14	2.22^{*}
	P	-.22	.05	-.13	.00						
Self-Acceptance (CPI)	Q	.09	.05	.00	.22	1.62	-.04	.16	.02	.26	2.21^{*}
	P	-.26	.25	.03	.27						
Factor P (MMPI)	Q	-.08	-.06	-.29	-.05	2.18^{*}	-.11	.13	-.24	-.03	2.20^{*}
	P	-.20	.24	-.21	.00						
Facilitation-Inhibition (MMPI)	Q	.09	-.10	.34	.18	2.21^{*}	.18	-.12	.22	.09	2.10^{*}
	P	.39	-.18	.12	.00						
POOR MORALE (MMPI)	Q	-.15	-.03	-.34	-.19	2.64^{**}	-.18	.08	-.24	-.08	2.05^{*}
	P	-.33	.21	-.17	.03						

Note: -- Values in the table are correlation coefficients. Critical comparisons have been circled.

L = Lecture Instruction
S = Self-study Instruction

Q = Quiz Sections
P = Paper Sections

$^{*}p < .05$
$^{**}p < .01$

.50 (e.g., CPI-Fe for male students and the essay test score), the largest of such average differences involving the Quiz vs. Paper or the Lecture vs. Self-study comparisons was less than .40 (e.g., CPI-fHa for male students and the essay test score). Moreover, the one measure which was constructed to act as an interaction variable, Siegel and Siegel's Educational Set Scale, failed to function in that role in the present study. These results can hardly be interpreted as providing overwhelming support for the interaction hypothesis.

Nonetheless, as was argued in Chapter I, existing personality measures, which have been constructed as general predictors, may well turn out to be less than ideal candidates for differential prediction. Consequently, it may be necessary to construct special scales for the latter purpose, and this was the second purpose of the present research project. The findings from analyses of empirically-constructed interaction scales are presented in Chapter V.

Chapter V

ANALYSES OF THE INTERACTION HYPOTHESIS: THE NEW EMPIRICAL INTERACTION SCALES

The results reported in Chapter IV are of ambiguous scientific import, since the number of significant interactions using a priori personality scales was not substantially greater than the number which might be expected by chance alone. Moreover, the relatively modest size of the significant correlational differences should produce no warming glow in the hearts of proponents of the interaction hypothesis. While some of the experimental procedures used in this project may have attenuated the strength of genuine interaction effects (see Chapter VI), it is possible that present personality scales are simply poor candidates for an interactive role. That is, scales constructed for the purposes of general prediction may by their very nature exclude the sort of personality variance most important in differential or interactive prediction, and consequently it may be necessary to construct new measures for this very purpose.

The rationale underlying the development of the new interaction scales was a simple one. Just as general predictors can be constructed by an item analysis against some external criterion (i.e., the method of empirical keying exemplified by the original scales from the SVIB, the MMPI, and the CPI), so should it be possible to construct differential (or interactive) scales by an analogous form of item analysis, now based upon two (or more) samples, each exposed to some different experimental treatment. For example, if one chose to construct a general measure of college achievement, one might correlate test items with some achievement criterion (e.g., cumulative grade point average) and select those items with high criterion correlations. A scale composed of those items which cross-validated on an independent sample might predict achievement across a wide range of instructional treatments. To construct an interactive achievement scale, on the other hand, one would search for items which produced large differences between the correlation in a sample of students exposed to one particular teaching condition and the correlation in a sample exposed to a different one. An item which correlated positively with course achievement in one condition and negatively in the other condition would be an excellent candidate for inclusion in an interaction scale, although the same item might be excluded as a general predictor since its correlation with the criterion in the combined samples would be near zero. A scale composed of such items should produce positive correlations with the criterion in one teaching condition and negative correlations in the other. The present chapter summarizes the results of efforts to construct scales of this very sort.

The two treatment conditions which were chosen for the development of empirical interaction scales were the Lecture-Quiz (LQ) and the Self-study-Paper (SP) sections in each of the two courses. This choice was based on the assumption that these two experimental treatments provide the most psychologically disparate teaching conditions, and consequently that scales constructed to interact with such highly structured (LQ) versus unstructured (SP) procedures should have maximal utility in future studies of the college instructional process.

Guided by this rationale, each of the items from seven inventories was correlated with each of the five criterion variables, separately within the LQ and the SP sections of each of the two courses. Male and female students were combined for purposes of scale construction. The seven inventories used in these analyses included the California Psychological Inventory (480 items), Adjective Check List

(300 items), Edwards Personal Preference Schedule (225 items), Educational Set Scale (93 items), Survey of Study Habits and Attitudes (75 items), Reported Behavior Inventory (250 items), and Oregon Instructional Preference Inventory (84 items). These particular inventories were selected so as to include (a) those whose items appeared to be particularly relevant for differential prediction in a college setting (OIPI, ESS, SSHA, and RBI), and (b) those popular published inventories which are likely in any case to be included in future studies of the college teaching process (CPI, ACL, and EPPS). Excluded were those inventories with (a) potentially offensive items (MMPI), (b) items to which responses by male and female students should differ significantly (SVIB), (c) items highly susceptible to some general form of response bias (WFPT and BSAS), (d) items from diverse separate scales (CPRI and CCPI), and finally (e) those inventories which either were not administered to the total sample of subjects (16PF and MAT) or which included relatively few items (Biographical Inventory and Predicted Peer Ratings). With only two exceptions (EPPS and ESS), all of the selected inventories were administered earlier in the term than were the excluded ones (see Table 2), and therefore students' responses to the former could be expected to be a bit more reliable and candid than their responses to the latter.

For each inventory and each of the five criteria, those items which produced significant differences between the correlations based upon the students in the LQ sections and those based upon the students in the SP sections of one course were included in an interaction scale; these items were keyed such that the correlations in the SP condition were more highly positive than the correlations in the LQ condition. This procedure yielded two interaction scales (one from each course), each of which was cross-validated on the students in the other course. In addition, those items which manifested statistically significant correlational differences between the LQ and SP treatments across both courses were used for the construction of a set of "cross-validated" interaction scales. These latter scales, designated by an X in the tables to follow, cannot be further cross-validated in the present project, and therefore they await independent confirmation in other college courses.

In examining the tables to follow, note that sometimes an "X" scale (composed of items which manifested significant correlational differences across both courses) may have almost as many (or, in some cases, even more) items than an interaction scale constructed within a single course, and that "X" scales of approximately the same number of items as single-course interaction scales may produce quite different correlational patterns. Since the "X" scales were developed by testing the significance of the four critical correlations across the two courses (i.e., $LQ_A + LQ_B - SP_A - SP_B$), they often include different items than those which reached statistical significance in one course alone ($LQ_A - SP_A$). Consequently, while the "X" scales are generally shorter than those developed within one course, they are not so constrained, and occasionally they are longer than one or both of the two course-specific scales.

It was not possible to find items with significant correlational differences for all possible inventory-criteria combinations. For example, the 75 items from the Survey of Study Habits and Attitudes did not produce enough significant correlational differences to warrant the construction of any SSHA interaction scales; consequently no findings based on this inventory will be presented.

The present chapter, like the preceding one, contains more technical information than the general reader may wish to cover. For this reason a summary of the cross-validity coefficients for the interaction scales constructed in each course is presented at the end of the chapter (Table 97), along with the reliability coefficients and convergent validities of the new "cross-validated" interaction scales (Table 98). The item number and keying direction for the items in all of the cross-validated scales are presented in Appendix A. The discussion to follow will focus on the interaction scales constructed from each inventory in turn.

California Psychological Inventory (CPI)

Since the CPI included more items than any of the other inventories selected for the development of interaction scales, it was possible to construct two sets of scales for each criterion in each course: short scales, which included those items with correlational differences between the LQ and the SP treatments which were significant at the .01 level; and long scales, which included all items which produced significant differences at the .05 level. Table 75 presents some analyses of the five CPI interaction scales empirically constructed from the course satisfaction outcome variable. The two SAT-A scales were developed from the students in Course A, while the two SAT-B scales were constructed from the students in Course B. The SAT-X scale includes those items with statistically significant ($p < .05$) correlational differences across the A and the B courses.

Insert Table 75 about here

Note that in the derivation samples correlational differences for these interaction scales ranged from 1.10 (SAT-B Long) to .78 (SAT-B Short); the maximum possible correlational difference (2.00) would be produced by a correlation of +1.00 in one treatment and -1.00 in the other. Items from all scales were keyed so as to produce negative correlations in the LQ sections and positive correlations in the SP sections of the derivation sample. However, as Table 75 indicates, when these scales were cross-validated on students in the other course, none of them produced a pattern of correlational differences in the expected direction. On the

Table 75

The Validity of the New CPI Interaction Scales Empirically Constructed from the Course Satisfaction Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
SAT-A (Short)	Q	-.44	.00	.15	-.08
7 items	P	.11	.40	.18	-.20
SAT-A (Long)	Q	-.40	.04	-.05	-.04
24 items	P	.20	.52	.14	-.07
SAT-B (Short)	Q	-.47	.21	.00	.00
6 items	P	.05	.31	-.08	-.11
SAT-B (Long)	Q	-.58	-.02	.08	-.08
23 items	P	-.08	.52	-.06	-.08

		Course A		Course B	
		L	S	L	S
SAT-X	Q	-.32	.06	-.36	-.14
13 items	P	.27	.32	.04	.25
(N)	Q	(101)	(84)	(86)	(81)
	P	(76)	(81)	(100)	(117)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "short" scales include all items producing correlational differences beyond the .01 level of significance, while the "long" scales include all items producing such differences beyond the .05 level. The "X" scale is composed of items with correlational differences beyond the .05 level in both courses, and thus the findings for this scale are not cross-validated.

other hand, the SAT-X scale, composed of items with significant correlational differences across both courses, produced correlations of -.32 and -.36 in the LQ sections, and +.32 and +.25 in the SP sections, of Courses A and B respectively. Whether this pattern of correlational differences will generalize to other settings must now await independent experimental confirmation.

Table 76 presents the results from the analyses of the CPI interaction scales constructed from the course achievement outcome variable. Again, sizable correlational differences in the derivation samples disappeared upon cross-validation. On the other hand, the cross-validated CPI achievement interaction scale (ACH-X) produced correlations of -.36 and -.48 in the LQ sections, and +.31 and +.18 in the SP sections, of Courses A and B respectively. Again, however, these results await replication.

Insert Table 76 about here

While the CPI scales developed to interact with course satisfaction and course achievement failed to cross-validate, those constructed against the non-graded reading outcome variable produced more encouraging results. The validities of these latter CPI interaction scales are presented in Table 77. Three of the four interaction scales produced correlational differences in the cross-validation samples which were in the predicted direction, and one of these (NGR-A Short) was statistically significant. For the NGR-X scale, correlations of -.23 and -.38 in the LQ sections contrasted with those of +.48 and +.35 in the SP sections (of Courses A and B respectively). However, as with the other cross-validated scales, these results demand further exploration.

Insert Table 77 about here

Table 76

The Validity of the New CPI Interaction Scales Empirically Constructed from the Course Achievement Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ACH-A (Short)	Q	-.29	.10	.13	.12
6 items	P	.13	.47	-.02	.12
ACH-A (Long)	Q	-.49	.02	-.15	.07
22 items	P	.01	.56	-.09	-.11
ACH-B (Short)	Q	-.46	.00	-.08	-.08
7 items	P	.02	.42	-.19	-.20
ACH-B (Long)	Q	-.54	.06	.01	.06
24 items	P	.00	.52	-.05	-.20

		Course A		Course B	
		L	S	L	S
ACH-X	Q	-.36	-.12	-.48	-.08
14 items	P	-.12	.31	.00	.18
(N)	Q	(101)	(84)	(86)	(81)
	P	(76)	(81)	(100)	(117)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "short" scales include all items producing correlational differences beyond the .01 level of significance, while the "long" scales include all items producing such differences beyond the .05 level. The "X" scale is composed of items with correlational differences beyond the .05 level in both courses, and thus the findings for this scale are not cross-validated.

Table 77

The Validity of the New CPI Interaction Scales
Empirically Constructed from the Non-graded Reading Outcome Variable

		Derivation Sample		Cross-Validation Sample		
		L	S	L	S	
NGR-A (Short)	Q	-.31	.08	-.12	.25	
7 items	P	.03	.48	.04	.18	*
NGR-A (Long)	Q	-.40	-.17	-.03	.27	
21 items	P	-.01	.62	.16	.14	
NGR-B (Short)	Q	-.52	-.05	.08	-.13	
6 items	P	.04	.39	-.22	.03	
NGR-B (Long)	Q	-.58	.10	.05	.14	
21 items	P	-.01	.49	-.04	.21	

		Course A		Course B	
		L	S	L	S
NGR-X	Q	-.23	-.04	-.38	.11
11 items	P	.05	.48	.06	.35
(N)	Q	(101)	(84)	(86)	(81)
	P	(76)	(81)	(100)	(117)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "short" scales include all items producing correlational differences beyond the .01 level of significance, while the "long" scales include all items producing such differences beyond the .05 level. The "X" scale is composed of items with correlational differences beyond the .05 level in both courses, and thus the findings for this scale are not cross-validated.

*p < .05 (one-tailed test).

Tables 78 and 79 present the results from the CPI interaction scales empirically constructed from the multiple-choice and essay test scores. Note that for both of these criteria, large correlational differences in the derivation samples disappeared upon cross-validation. Although the MC-X and the ESY-X scales both produced the expected correlational pattern across the two courses, only further experimental study can ascertain whether these correlational differences represent anything more than chance effects.

Insert Tables 78 and 79 about here

Oregon Instructional Preference Inventory (OIPI)

The Oregon Instructional Preference Inventory consisted of 84 forced-choice items (e.g., "A formal class vs. an informal class," "Studying alone vs. studying with others," "A multiple-choice question vs. an essay question," "Unannounced tests vs. regularly scheduled tests," "Reading a paper vs. hearing the paper read"), and the students were asked to indicate which of the two alternatives they most preferred. The OIPI was developed in the belief that these paired-comparisons between instructional modes would prove to be an unusually fertile item pool for the construction of interaction scales since the item content relates directly to individual differences in instructional preferences. The OIPI is included in this report as Appendix D.

Table 80 presents the results from the analyses of OIPI interaction scales constructed from the course satisfaction outcome variable. Note that the OIPI interaction scales did not produce statistically significant correlational differences

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Insert Table 80 about here

Table 78

The Validity of the New CPI Interaction Scales
Empirically Constructed from the Multiple-choice Test Score

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
MC-A (Short)	Q	-.40	-.14	-.09	.12
7 items	P	-.12	.53	-.10	.00
MC-A (Long)	Q	-.46	-.01	-.12	.02
22 items	P	-.10	.59	.03	-.11
MC-B (Short)	Q	-.45	.06	.13	-.06
6 items	P	.13	.43	-.07	.01
MC-B (Long)	Q	-.53	.15	.13	-.04
23 items	P	.07	.51	.07	-.09

		Course A		Course B	
		L	S	L	S
MC-X	Q	-.17	-.20	-.24	-.13
8 items	P	.12	.33	-.09	.27
(N)	Q	(101)	(84)	(86)	(81)
	P	(76)	(81)	(100)	(117)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "short" scales include all items producing correlational differences beyond the .01 level of significance, while the "long" scales include all items producing such differences beyond the .05 level. The "X" scale is composed of items with correlational differences beyond the .05 level in both courses, and thus the findings for this scale are *not* cross-validated.

Table 79

The Validity of the New CPI Interaction Scales Empirically Constructed from the Essay Test Score

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ESY-A (Short)	Q	-.22	.21	.13	-.04
7 items	P	.08	.61	.08	.09
ESY-A (Long)	Q	-.32	.11	.07	.02
22 items	P	.11	.66	.07	.02
ESY-B (Short)	Q	-.40	.04	-.17	.06
6 items	P	.06	.38	-.19	-.21
ESY-B (Long)	Q	-.49	.04	-.05	.14
18 items	P	.02	.46	-.19	-.07

		Course A		Course B	
		L	S	L	S
ESY-X	Q	-.35	.10	-.44	.08
17 items	P	.21	.38	-.11	.26
(N)	Q	(101)	(84)	(86)	(81)
	P	(76)	(81)	(100)	(117)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "short" scales include all items producing correlational differences beyond the .01 level of significance, while the "long" scales include all items producing such differences beyond the .05 level. The "X" scale is composed of items with correlational differences beyond the .05 level in both courses, and thus the findings for this scale are not cross-validated.

Table 80

The Validity of the New OIPI Interaction Scales

Empirically Constructed from the Course Satisfaction Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
SAT-A	Q	-.48	.10	-.16	.10
15 items	P	-.10	.39	-.12	-.10
SAT-B	Q	-.41	-.04	-.29	.01
6 items	P	-.05	.15	-.04	-.23

		Course A		Course B	
		L	S	L	S
SAT-X	Q	-.29	-.06	-.19	.09
3 items	P	.02	.08	-.14	.16
(N)	Q	(107)	(95)	(92)	(93)
	P	(85)	(87)	(113)	(121)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

upon cross-validation. Moreover, since only three OIPI items produced significant interactions across both courses, the short OIPI SAT-X scale probably does not merit any further investigation.

Table 81 presents the findings from the OIPI interaction scales constructed from the course achievement outcome variable. While these scales produced a pattern of cross-validated correlations in the expected direction, none of these differences was large enough to reach statistical significance. The six-item ACH-X scale might best be viewed as a source of hypotheses for new items to be included in future studies.

Insert Table 81 about here

Table 82 presents the results of analyses of the OIPI interaction scales constructed from the non-graded reading outcome variable. Note that sizable correlational differences in the derivation samples did not replicate upon cross-validation, and therefore one should not place much faith in the generality of the short OIPI NGR-X scale.

Insert Table 82 about here

Tables 83 and 84 present the findings based on OIPI interaction scales constructed from the multiple-choice and the essay test scores. Three of the four cross-validated correlational differences were in the expected direction, and one of these (MC-A) reached statistical significance. Again, however, the short cross-validated scales seem unlikely to be very robust in further investigations. Since the OIPI was expressly developed for the purpose of constructing empirical interaction scales, their relatively poor performance in this context is particularly disheartening.

Insert Tables 83 and 84 about here

Table 81

The Validity of the New OIPI Interaction Scales

Empirically Constructed from the Course Achievement Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ACH-A	Q	-.39	-.10	-.09	.05
19 items	P	-.02	.46	.13	.07
ACH-B	Q	-.40	.02	.03	-.06
13 items	P	.20	.38	-.05	.17

		Course A		Course B	
		L	S	L	S
ACH-X	Q	-.17	.04	-.22	.18
6 items	P	.10	.30	.12	.23
(N)	Q	(107)	(95)	(92)	(93)
	P	(85)	(87)	(113)	(121)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences (p < .05) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 82

The Validity of the New OIPI Interaction Scales Empirically Constructed from the Non-graded Reading Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
NGR-A	Q	-.32	.15	-.02	-.17
7 items	P	-.10	.47	.05	.03
NGR-B	Q	-.54	-.10	-.04	.03
11 items	P	-.02	.36	-.06	-.18

		Course A		Course B	
		L	S	L	S
NGR-X	Q	-.20	-.12	-.14	-.05
4 items	P	-.06	.11	.01	.26
(N)	Q	(107)	(95)	(92)	(93)
	P	(85)	(87)	(113)	(121)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are *not* cross-validated.

Table 83

The Validity of the New OIPI Interaction Scales Empirically Constructed from the Multiple-choice Test Score

		Derivation Sample		Cross-Validation Sample		
		L	S	L	S	
MC-A	Q	-.37	-.10	-.19	-.07	*
8 items	P	-.05	.34	.05	.06	
MC-B	Q	-.42	.03	.00	.09	
7 items	P	.17	.37	.17	.06	

		Course A		Course B	
		L	S	L	S
MC-X	Q	-.17	.02	-.26	.12
6 items	P	.02	.30	.07	.29
(N)	Q	(107)	(95)	(92)	(93)
	P	(85)	(87)	(113)	(121)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences (p < .05) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

*p < .05 (one-tailed test).

Table 84

The Validity of the New OIPI Interaction Scales

Empirically Constructed from the Essay Test Score

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ESY-A	Q	-.20	.06	-.07	-.15
5 items	P	.09	.41	.05	.00
ESY-B	Q	-.43	.01	.06	.08
9 items	P	-.04	.30	-.04	-.05

		Course A		Course B	
		L	S	L	S
ESY-X	Q	-.22	-.15	-.23	-.21
4 items	P	-.07	.29	.07	.12
(N)	Q	(107)	(95)	(92)	(93)
	P	(85)	(87)	(113)	(121)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Reported Behavior Inventory (RBI)

Another experimental item pool which on a priori grounds appeared to offer an unusually fruitful source for the construction of interaction scales was that included in the RBI. The results of analyses using these highly reliable items to construct interaction scales from the course satisfaction outcome variable are presented in Table 85. Note that large correlational differences in the derivation sample reverse direction upon cross-validation, and only six items were available for the construction of an RBI cross-validated interaction scale.

Insert Table 85 about here

Table 86 presents the findings from the RBI interaction scales constructed from the course achievement outcome variable. Again, sizable correlational differences in the derivation samples disappeared upon cross-validation, a finding which does not bode well for the generality of the RBI ACH-X scale.

Insert Table 86 about here

On the other hand, when RBI items were used to construct interaction scales against the non-graded reading outcome variable, the results--presented in Table 87--were a bit more encouraging. Both scales produced correlational differences in the predicted direction and one of these (NGR-B) was statistically significant. The NGR-X scale produced correlations of -.39 and -.41 in the LQ sections, and +.28 and +.35 in the SP sections, of Courses A and B respectively. These large correlational differences, combined with the relative success of the course specific interaction measures, suggest that RBI NGR-X be included in future investigations.

Insert Table 87 about here

Table 85

The Validity of the New RBI Interaction Scales Empirically Constructed from the Course Satisfaction Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
SAT-A	Q	-.45	-.13	.29	.11
12 items	P	.13	.42	.12	-.14
SAT-B	Q	-.46	-.05	.14	.19
11 items	P	.04	.41	-.05	-.03

		Course A		Course B	
		L	S	L	S
SAT-X	Q	-.16	.00	-.41	.09
6 items	P	-.04	.21	-.01	.25
(N)	Q	(103)	(90)	(91)	(89)
	P	(84)	(90)	(109)	(119)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 86

The Validity of the New RBI Interaction Scales
Empirically Constructed from the Course Achievement Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ACH-A	Q	-.35	-.04	.10	.13
6 items	P	.11	.45	.12	.07
ACH-B	Q	-.50	-.02	-.09	-.10
12 items	P	-.08	.28	.02	.07

		Course A		Course B	
		L	S	L	S
ACH-X	Q	-.35	-.08	-.35	.07
8 items	P	-.05	.18	-.05	.18
(N)	Q	(103)	(90)	(91)	(89)
	P	(84)	(90)	(109)	(119)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 87

The Validity of the New RBI Interaction Scales

Empirically Constructed from the Non-graded Reading Outcome Variable

		Derivation Sample		Cross-Validation Sample		
		L	S	L	S	
NGR-A	Q	-.41	.00	.00	.04	
10 items	P	-.07	.43	.02	.13	
NGR-B	Q	-.53	-.10	-.32	.03	*
11 items	P	-.20	.46	.11	-.03	

		Course A		Course B	
		L	S	L	S
NGR-X	Q	-.39	-.05	-.41	.03
10 items	P	.06	.28	.00	.35
(N)	Q	(103)	(90)	(91)	(89)
	P	(84)	(90)	(109)	(119)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

*$p < .05$ (one-tailed test)

Finally, Tables 88 and 89 present the findings from the RBI interaction scales constructed from the multiple-choice and essay test scores. In both cases, large correlational differences in the derivation samples disappeared upon cross-validation, and relatively few items were available for the development of cross-validated scales.

Insert Tables 88 and 89 about here

Adjective Check List (ACL)

Table 90 presents the findings from analyses of the ACL interaction scales constructed from the course satisfaction outcome variable. One of these scales (SAT-B) produced a cross-validated correlational difference that was statistically significant. The ACL SAT-X scale produced correlations of -.45 and -.34 in the LQ sections, and +.14 and +.33 in the SP sections, of Courses A and B respectively.

Insert Table 90 about here

Table 91 presents the results for the ACL interaction scales constructed from the course achievement outcome variable. Note that large correlational differences in the derivation sample, while all in the expected direction upon cross-validation, were not statistically significant. The ACL ACH-X scale produced correlations of -.25 and -.36 in the LQ sections, and +.32 and +.22 in the SP sections, of Courses A and B respectively.

Insert Table 91 about here

Table 88

The Validity of the New RBI Interaction Scales
Empirically Constructed for the Multiple-choice Test Score

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
MC-A	Q	-.37	.12	.08	.11
7 items	P	-.02	.48	.12	-.06
MC-B	Q	-.38	-.01	.12	-.09
10 items	P	.02	.52	.02	-.02

		Course A		Course B	
		L	S	L	S
MC-X	Q	-.28	.02	-.27	.06
9 items	P	.01	.30	.02	.32
(N)	Q	(103)	(90)	(91)	(89)
	P	(84)	(90)	(109)	(119)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 89

The Validity of the New RBI Interaction Scales
Empirically Constructed from the Essay Test Score

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ESY-A	Q	-.34	-.14	.08	-.11
8 items	P	.08	.54	-.04	.00
ESY-B	Q	-.50	.11	.06	-.09
8 items	P	.05	.18	.04	.15

		Course A		Course B	
		L	S	L	S
ESY-X	Q	-.16	-.01	-.31	-.12
9 items	P	.10	.43	.03	.24
(N)	Q	(103)	(90)	(91)	(89)
	P	(84)	(90)	(109)	(119)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 90

The Validity of the New ACL Interaction Scales Empirically Constructed from the Course Satisfaction Outcome Variable

		Derivation Sample		Cross-Validation Sample		
		L	S	L	S	
SAT-A	Q	-.55	.09	-.06	.02	
17 items	P	.20	.46	.13	-.04	
SAT-B	Q	-.47	.19	-.32	-.12	*
11 items	P	.15	.38	.19	-.05	

		Course A		Course B	
		L	S	L	S
	Q	-.45	.10	-.34	-.02
	P	.12	.14	.06	.33
(N)	Q	(105)	(89)	(91)	(93)
	P	(85)	(88)	(114)	(122)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences (p < .05) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

*p < .05 (one-tailed test)

Table 91

The Validity of the New ACL Interaction Scales Empirically Constructed from the Course Achievement Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ACH-A	Q	-.55	-.32	-.22	-.03
11 items	P	-.13	.34	-.21	-.18
ACH-B	Q	-.44	-.16	-.11	-.22
13 items	P	.04	.40	-.26	-.02

		Course A		Course B	
		L	S	L	S
ACH X	Q	-.25	-.22	-.36	-.03
8 items	P	-.20	.32	-.08	.22
(N)	Q	(105)	(89)	(91)	(93)
	P	(85)	(88)	(114)	(122)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are *not* cross-validated.

Finally, the findings based on the ACL interaction scales constructed from the non-graded reading outcome variable are presented in Table 92. Again, large correlational differences in the derivation sample almost disappeared on cross-validation, although all of them were in the predicted direction. The ACL NGR-X scale produced correlations of -.25 and -.37 in the LQ sections, and +.38 and +.32 in the SP sections, of Courses A and B respectively. No ACL interaction scales were constructed for the multiple-choice and the essay test scores.

Insert Table 92 about here

Edwards Personal Preference Schedule (EPPS)

Table 93 presents the results for the EPPS interaction scales constructed from the course satisfaction outcome variable. Note that relatively large correlational differences in the derivation sample virtually disappeared on cross-validation. The EPPS SAT-X scale produced correlations of -.31 and -.27 in the LQ sections, and +.31 and +.31 in the SP sections, of Courses A and B respectively.

Insert Table 93 about here

Table 94 presents the results from the EPPS interaction scales constructed from the course achievement outcome variable. Once again, large correlational differences in the derivation sample did not cross-validate. The EPPS ACH-X scale produced correlations of -.38 and -.25 in the LQ sections, and +.39 and +.34 in the SP sections, of Courses A and B respectively.

Insert Table 94 about here

Table 92

The Validity of the New ACL Interaction Scales

Empirically Constructed from the Non-graded Reading Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
NGR-A	Q	-.31	-.11	-.07	.03
14 items	P	-.10	.53	.15	.09
NGR-B	Q	-.42	-.20	-.03	-.05
14 items	P	.09	.32	-.07	.09

		Course A		Course B	
		L	S	L	S
NGR-X	Q	-.25	.04	-.37	-.05
14 items	P	-.10	.38	.03	.32
(N)	Q	(105)	(89)	(91)	(93)
	P	(85)	(88)	(114)	(122)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 93

The Validity of the New EPPS Interaction Scales

Empirically Constructed from the Course Satisfaction Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
SAT-A	Q	-.36	-.11	.14	-.12
10 items	P	.08	.54	-.04	-.01
SAT-B	Q	-.38	-.05	-.03	-.12
11 items	P	-.25	.37	-.15	.09

		Course A		Course B	
		L	S	L	S
SAT-X	Q	-.31	-.09	-.27	.03
7 items	P	.04	.31	-.17	.31
(N)	Q	(103)	(85)	(90)	(88)
	P	(75)	(83)	(102)	(114)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 94

The Validity of the New EPPS Interaction Scales Empirically Constructed from the Course Achievement Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ACH-A	Q	-.41	.00	-.11	-.14
10 items	P	-.01	.47	-.05	.10
ACH-B	Q	-.47	-.15	-.01	-.11
12 items	P	.06	.50	-.18	-.09

		Course A		Course B	
		L	S	L	S
ACH-X	Q	-.38	-.12	-.25	-.17
10 items	P	.10	.39	-.07	.34
(N)	Q	(103)	(85)	(90)	(88)
	P	(75)	(83)	(102)	(114)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Finally, Table 95 presents the results for the EPPS interaction scales constructed from the non-graded reading outcome variable. Again, none of the cross-validated correlational differences was statistically significant. The EPPS NGR-X scale produced correlations of -.29 and -.35 in the LQ sections, and +.28 and +.29 in the SP sections, of Courses A and B respectively.

Insert Table 95 about here

Educational Set Scale (ESS)

While neither the ESS total score, nor any of the ESS sub-scores, played a powerful interactive role (see Table 24), it is possible that individual ESS items might be combined to form a more potent interaction scale. The results of such an attempt are presented in Table 96. Two ESS interaction scales were developed from the course achievement outcome criterion, and both of them cross-validated in the predicted direction. However, none of the cross-validated correlational differences was statistically significant. Moreover, since the ESS interaction scales constructed in the two courses shared only three items, no cross-validated scale was constructed. Thus, these findings do not confirm Siegel and Siegel's assumption that the ESS is an especially fruitful interaction variable.

Insert Table 96 about here

Table 95

The Validity of the New EPPS Interaction Scales Empirically Constructed from the Non-graded Reading Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
NGR-A	Q	-.32	-.03	-.09	.14
10 items	P	-.03	.53	.03	-.07
NGR-B	Q	-.41	.16	-.01	-.01
12 items	P	.09	.44	.15	.12

		Course A		Course B	
		L	S	L	S
NGR-X	Q	-.29	.19	-.35	.22
7 items	P	-.02	.28	.10	.29
(N)	Q	(103)	(85)	(90)	(88)
	P	(75)	(83)	(102)	(114)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. The "X" scale includes those items with significant correlational differences in both courses, and thus the findings for this scale are not cross-validated.

Table 96

The Validity of the New ESS Interaction Scales
Empirically Constructed from the Course Achievement Outcome Variable

		Derivation Sample		Cross-Validation Sample	
		L	S	L	S
ACH-A	Q	-.34	.05	-.02	.11
17 items	P	.14	.38	.33	.13
ACH-B	Q	-.22	.16	-.02	.19
16 items	P	.35	.47	.16	.14

		Course A		Course B	
		L	S	L	S
(N)	Q	(103)	(87)	(86)	(88)
	P	(78)	(87)	(105)	(110)

Note: -- The "A" and "B" scales include those items which produced significant correlational differences ($p < .05$) between the students in the LQ (most structured) and the SP (least structured) sections of Course A and Course B, respectively; these critical comparisons have been circled in the table. Since these scales share only three items, no cross-validated ("X") scale was constructed.

A Summary of Analyses of the New Interaction Scales

Table 97 summarizes the findings previously presented in Tables 75 to 96. The values in the table are the arithmetic differences between the correlations in the LQ (most structured) and the SP (least structured) sections of the two experimental courses. The upper section of the table presents the cross-validated correlational differences (the results in Course B of the scales derived in Course A, and vice versa). The signs of all of the values in Table 97 have been reflected so that positive values indicate correlational differences in the same direction as in the derivation samples and negative values indicate differences in the opposite direction.

Insert Table 97 about here

Of the 20 interaction scales constructed from the CPI item pool, only six (30%) cross-validated in the predicted direction. Of 10 RBI interaction scales, only four (40%) cross-validated in the predicted direction. On the other hand, 100% of the ACL interaction scales, 80% of the OIPI interaction scales, and 67% of the EPPS interaction scales cross-validated in the predicted direction. Thus, relative to scales from other inventories, the ACL and the OIPI interaction scales produced more replicated interaction effects, though few of these were statistically significant.

Viewed another way, 42% of the scales constructed from the course satisfaction criterion, 64% of the scales constructed from the course achievement criterion, and 83% of the scales constructed from the non-graded reading criterion produced cross-validated correlational differences in the predicted direction. Contrary to initial expectations, the course satisfaction outcome variable turned out to be the least promising candidate for differential prediction and the non-graded reading criterion was the most promising one.

Table 97

The Validity of Each of the New Empirical Interaction Scales: Summary Table

Interaction Scale	Outcome Variable				
	Course Satisfaction	Course Achievement	Non-graded Reading	Multiple-Choice Test Score	Essay Test Score
CPI-Short-A	-.35	-.01	.30*	.09	-.04
CPI-Short-B	-.11	-.12	-.05	-.12	-.04
CPI-Long-A	-.02	.04	.17	.01	-.05
CPI-Long-B	-.16	-.19	.16	-.22	-.02
OIPI-A	.06	.16	.05	.25*	.07
OIPI-B	.06	.14	-.14	.06	-.11
RBI-A	-.43	-.03	.13	-.14	-.08
RBI-B	-.17	.16	.29*	-.14	.09
ACL-A	.02	.04	.16		
ACL-B	.27*	.09	.12		
EPPS-A	-.15	.21	.02		
EPPS-B	.12	-.08	.13		
ESS-A		.15			
ESS-B		.16			
CPI-X	.62	.66	.72	.50	.72
OIPI-X	.36	.46	.36	.51	.43
RBI-X	.52	.53	.72	.58	.57
ACL-X	.63	.58	.66		
EPPS-X	.60	.68	.60		

Note: -- The values in the table are the arithmetic differences between the correlations in the LQ (most structured) and the SP (least structured) sections. The upper section of the table presents cross-validated correlational differences (the results in Course B of the scales derived in Course A, and vice versa). The lower section of the table presents the correlational differences for the "X" scales (composed of items with significant correlational differences in both courses); these values are not cross-validated. The signs of all values have been reflected so that positive values indicate correlational differences in the same direction as in the derivation sample and negative values indicate differences in the opposite direction. *$p < .05$ (one-tailed test)

The lower section of Table 97 presents the correlational differences for the "X" scales (composed of items with significant correlational differences across both courses); these values cannot be further cross-validated in the present project, and consequently their generality awaits further experimental investigation. While these correlational differences ranged from .36 to .72, the values are certainly inflated by capitalization on chance. One way to estimate the potential generality of such scales is to ascertain their internal consistency and to examine the intercorrelations among the interaction scales constructed from different inventories for the same criterion measure. These data are presented in Table 98.

Insert Table 98 about here

The scales included in Table 98 are the "X" scales listed in Table 97. The table presents the number of items in each scale, the Kuder-Richardson Formula 20 reliability coefficients (separately computed for the total male and the total female samples), and the convergent validities of different interaction scales constructed from the same criterion variable.

As Table 98 indicates, neither the reliabilities nor the convergent validities of these new empirical interaction scales were particularly promising. While 83% of the reliability coefficients--and the same proportion of convergent validities--were positive, the size of these coefficients leaves much to be desired. Part of the problem clearly lies in the shortness of the scales (the longest had only 17 items), although longer scales (of 25 and 50 items) which were developed by lowering the significance level for item inclusion generally failed to increase the resulting reliability coefficients. Moreover, the low convergent validity values for different interaction scales constructed from the same criterion suggest that a composite scale made up of items from all of the inventories presented in Table 98 would also possess rather low internal consistency.

Table 98

The Number of Items in, KR-20 Reliability of, and Intercorrelations among the New Interaction Scales Constructed from Each of Five Inventories

Criterion	Inventory	No. of Items	Reliability (KR-20)		Intercorrelations				
			Males	Females	CPI	OIPI	RBI	ACL	EPPS
Course Satisfaction	CPI	13	.30	.30	-	.09	.06	.17	.07
	OIPI	3	-.10	-.07	.04	-	-.03	.01	-.04
	RBI	6	.02	-.01	.01	.04	-	.06	.09
	ACL	8	.29	.29	.18	.10	.01	-	-.15
	EPPS	7	.16	.13	.08	.07	.05	.10	-
Course Achievement	CPI	14	.37	.33	-	.26	.22	.26	.14
	OIPI	6	.23	.13	.10	-	.17	.13	.14
	RBI	8	.34	.22	.28	.03	-	.16	.14
	ACL	8	.05	.09	.27	-.04	.24	-	.12
	EPPS	10	.16	.32	.06	.04	.09	.04	-
Non-graded Reading	CPI	11	.21	.32	-	.06	.12	.12	.12
	OIPI	4	.02	.04	.07	-	.04	-.01	.04
	RBI	10	.22	.00	.07	.00	-	.19	.19
	ACL	14	.49	.41	.14	-.03	.13	-	.01
	EPPS	7	.13	-.03	.11	-.04	.09	.16	-
Multiple-Choice Test	CPI	8	.18	.24	-	-.08	-.10		
	OIPI	6	.01	-.03	.04	-	.08		
	RBI	9	.24	.21	-.06	.08	-		
Essay Test	CPI	17	.38	.29	-	-.09	.12		
	OIPI	4	-.10	-.04	-.04	-	.03		
	RBI	9	.08	.14	.11	.01	-		

Note: -- The scales included in the above analyses are the "X" scales listed in Table 97. Correlations from the male sample (N = 292) are listed above the main diagonals and those from the female sample (N = 372) are listed below the diagonals; both of these samples include only those subjects who completed all five inventories. The KR-20 reliability coefficients, on the other hand, were calculated from the responses of the larger sample of subjects who completed each inventory:

(N)		CPI	OIPI	RBI	ACL	EPPS
	Males	(350)	(394)	(375)	(383)	(354)
	Females	(430)	(460)	(453)	(460)	(432)

These findings cannot be ascribed simply to such procedural factors as the mixing of male and female subjects or the selection of the LQ vs. SP treatment comparison over the Q vs. P (or the L vs. S) ones. Empirical interaction scales for one inventory (the OIPI) were constructed separately within the male and the female samples for each of the three treatment comparisons (LQ vs. SP, Q vs. P, and L vs. S). The resulting six sets of interaction scales appeared to be no more promising than those already discussed in this Chapter. These findings, while obviously not conclusive, do not bode well for the generality of the empirical interaction scales. Nonetheless, this crucial question cannot be settled until the scales are used in further experimental investigations.

In summary, then, scales specifically constructed as interaction variables based upon the responses of students in one course generally did not produce statistically significant correlational differences when the scales were cross-validated on students in the other course. Moreover, items which produced significant correlational differences across both courses were relatively rare, and the scales constructed from these items, while producing large correlational differences, showed low internal consistency and low convergent validity. While it is apparent that these latter scales must be further validated in other college courses, the findings from the present project provide no firm basis for expecting them to have wide generality. Some factors which may have led to these rather discouraging findings will be discussed in the next chapter.

Chapter VI

SITUATIONS AS MODERATOR VARIABLES:
A DISCUSSION OF THE FINDINGS FROM THE PRESENT PROJECT

Ideas in psychology appear, disappear, and then reappear like the light from a beacon on a foggy night. However, since each re-emergence of the same concept is typically labeled in some new way, it is often difficult to see that a new conception is but an old one packaged in another linguistic container. Thus, while Cronbach (1957) may correctly be credited with popularizing the search for trait-by-treatment interactions in psychology, his position was hardly novel. The statistical notion of interaction effects is at least as old as the analysis of variance, and the trait-by-treatment application has such antecedents as the "stimulus-organism interaction" in S-O-R learning theories, and the attempts at "differential prediction" or "classification" in applied psychology (e.g., Brogden, 1946, 1954, 1955; Horst, 1954). If one can match men to jobs in industrial and military settings, is it any less reasonable to attempt to match students to colleges (e.g., Astin, 1962, 1963; Astin & Holland, 1961; Pace & Stern, 1958; Stern, 1963)--or within one college to course curricula (e.g., Astin, 1965)--or within one curriculum to specific instructional formats?

While the historical roots of the trait-by-treatment interaction hypothesis are deep ones, some current developments in psychology make their study of particular contemporary significance. The veritable explosion of interest in the technology of "behavior modification" and in the search for a "social learning theory" has led to a rejection of the classical psychometric assumption of enduring personality attributes, in favor of a strictly situational stance towards personality prediction (Mischel, 1968). Psychometricians have never denied the importance of situational influences on human behavior. Rather they have observed the wide variations in behaviors which seem to occur in seemingly the same situation (e.g., academic performance in one college course), and have posited that relatively enduring aspects of personality structure (i.e., traits) be invoked to help explain these individual differences. Few would deny that situations do not constrain the average level or amount (i.e., the _mean_) of some classes of behaviors, nor the amount of variation (i.e., the _variance_) of these behaviors among a group of people. On the other hand, trait theorists would presume that--within the limits of measurement precision--the rank ordering of individuals on the personalogical attribute invoked by the response class would be generally the same across situations (unless of course this ranking was itself constrained by sheer curtailment of variance). However, proponents of modern social learning theory appear to be proposing that different situations (each of which permit roughly the same variation in behaviors in some significant response class) produce radically different rank orderings of subjects on the level of behaviors in that class. If this is indeed the case, situations might be conceptualized as "moderator variables" (Saunders, 1956) for the relationships between personality characteristics and these overt behaviors.

The present research program, while not directly inspired by contemporary social learning theory, may be viewed as providing an indirect test of this critical assumption. Defining a moderator variable as any situational or other influence which affects the correlation between two other variables, then the present project can be seen as exploring the potential moderating effects of differing instructional treatments upon the relationships between putative personality attributes (i.e., inventory scale scores) and three major classes of criterion behaviors. As argued in Chapter I, the existence of such powerful moderating influences (or interaction effects) is presupposed by most serious investigators of the college instructional process. For example, Siegel and Siegel (1967) phrase this crucial assumption in the following ways:

> "As a generalization, educational performance is encouraged when the instructional setting is congruent with the learner's idiosyncratic drive pattern and discouraged when the setting and the learner's drive pattern are dissonant." (p. 323)
>
> "Certain features of the instructional environment which are congruent with a particular idiosyncratic drive pattern have the power to facilitate performance. Certain features of the instructional environment which are dissonant with an idiosyncratic drive pattern have the power to inhibit performance." (p. 324)

Other statements to the same effect have been cited in Chapter I.

If powerful attribute-treatment interactions actually characterize the college instructional process, then differential predictions of course outcomes (utilizing knowledge of these interaction effects) should be superior to predictions based solely upon main effects. For example, if some types of students are more satisfied in Quiz than in Paper sections, while for others the reverse is true (operationally, if the relation between some personality inventory score and the course satisfaction outcome variable differs significantly for students in the Quiz and the Paper sections), then predictions of course satisfaction based upon knowledge of the student's instructional treatment (e.g., Quiz vs. Paper) and their scale scores should be superior to those based solely on either type of variable by itself. The present research project allows a direct test of this hypothesis, and thereby permits some specification of the relative strength of interaction effects as compared to main effects alone.

The Relative Strength of Interaction vs. Main Effects

The trait-by-treatment paradigm, which inspired the experimental design used in the present project, permits a test of two sources of general prediction (i.e., two classes of main effects) and one source of differential prediction (i.e., one type of interaction effect). Chapter III provided a comparison of the relative strength of the two types of main effects, namely those due to the experimental treatment variations (across all subjects) and those due to personality attributes (across all instructional treatments). These results--in line with those from nearly half a century of past college instructional research--indicated that one of these two types of main effects had little predictive power. The findings presented in Table 7 of Chapter III showed that the experimental treatment procedures used in the present project produced no statistically significant main effects common to both of the two courses. That is, these differences in instructional conditions did not show either sizable or replicable main effects against any of the five outcome variables for the average student in these two courses.

Consequently, in this as in past studies of the college instructional process, only one type of main effect need be further considered, namely that stemming from the personality attributes of the students themselves. One way to gauge the strength of the significant interaction effects reported in Chapter IV is to compare their predictive power with that achievable by such general predictors alone. That is, if predictions are made for every student in each of the two experimental courses (forecasting their relative standing on each of the major outcome variables), the validity of predictions based solely on general predictors can be compared with the validity of predictions made on the basis of the most significant interaction effects (i.e., taking into account both the treatment condition to which the student was assigned and his score on the personality scale which produced a significant interaction).

To ascertain the validity of scale X as a general predictor of some criterion, one would simply average the correlations between scale scores and the criterion values across all of the experimental treatment conditions, weighting these correlations by the number of subjects in each condition. Such a procedure yields an unbiased estimate of the correlation (r_G) between scale X and the criterion in the total sample of subjects (i.e., across all treatment conditions), and the square of this correlation (r_G^2) indicates the proportion of criterion variance predictable from the use of scale X as a general predictor. Assuming samples of equal size in each treatment condition, the procedure for obtaining an unbiased estimate of the validity of scale X as a general predictor of criterion C across K treatments is given in equation (1):

$$r_G = \frac{\sum_{i=1}^{K} r_{x \cdot c}}{K} \qquad (1)$$

In the present project, each of the a priori personality scales was correlated with each of the five criteria in turn, separately for males and females within each of the two experimental courses (i.e., pooling students in all four treatment conditions). Consequently, the validity of any single personality scale as a general predictor can be estimated by averaging these correlations across the two courses, e.g.:

$$r_G = \frac{r_A + r_B}{2} \qquad (2)$$

where r_A and r_B are the correlations between scale X and the criterion ($r_{x \cdot c}$) in Courses A and B, respectively.

If scale X is to be used as a differential predictor of the same criterion, the particular treatment to which each student has been assigned as well as his score on scale X can be used to generate the predictions. Specifically, if the correlation between scale X and the criterion were -.10 for students in treatment I and +.30 in treatment II, the following differential predictions would be made:

For students in Treatment I: $\hat{Z}_c = -.10Z_x$

For students in Treatment II: $\hat{Z}_c = +.30Z_x$

where Z_x is the student's standard score on scale X, and $\hat{Z}_c$ is his predicted (standard) score on the criterion variable. If there are no mean differences on the criterion between students in treatments I and II, then an unbiased estimate of the overall validity in predicting this criterion across all of the students in both treatments is given in equation (3):

$$r_D = r_{\hat{Z}_c \cdot Z_c} = \sqrt{\frac{r_I^2 + r_{II}^2}{2}} \qquad (3)$$

where $\hat{Z}_c$ and Z_c are the predicted and actual (standard) scores on the criterion, r_I and r_{II} are the correlations between scale X and the criterion ($r_{x \cdot c}$) in treatments I and II, and where there are equal numbers of subjects in the two treatments. For this example, the validity of scale X as a differential predictor would be around .22, while as a general predictor scale X would produce a validity coefficient of only .10.

In general, the procedure for obtaining an unbiased estimate of the validity of scale X as a differential predictor (r_D) is given in equation (4):

$$r_D = \sqrt{\frac{\sum_{i=1}^{K} r_{x \cdot c}^2}{K}} \qquad (4)$$

where K is the number of separate treatments, $r_{x \cdot c}$ is the correlation between scale X and the criterion in each treatment, and again where it is assumed that there are samples of equal size in each treatment and no mean differences between treatments on the criterion variable. In the present project, each of the *a priori* personality scales was correlated with each of the five criteria, separately for males and females within each of the two courses, and separately for students assigned to each of the two main experimental teaching conditions (i.e., the Quiz (Q) vs. Paper (P), and the Lecture (L) vs. Self-study (S), treatments). The validity of any single personality scale as a differential predictor can be estimated by equation (5) for the Quiz (Q) vs. Paper (P) interactions:

$$r_D = \sqrt{\frac{r_Q^2 + r_P^2}{2}} \qquad (5)$$

and equation (6) for the Lecture (L) vs. Self-study (S) interactions:

$$r_D = \sqrt{\frac{r_L^2 + r_S^2}{2}} \qquad (6)$$

where r_Q, r_P, r_L, and r_S are the *average correlations across the two courses* between scale X and the criterion for students in the Q, P, L, and S treatments, respectively.

A comparison of equations (1) and (4) should convince the reader that, *for the same scale*, r_D will always be larger than r_G (except in the trivial case where the correlations in each of the K treatments are all identical, in which case the two coefficients are the same). That is, if scale X is used both for general prediction (r_G) and for differential prediction (r_D) within the same sample, it will always achieve higher validity as a differential than as a general predictor. For a comparison of the relative strength of interaction effects and main effects, however, one would not necessarily utilize *the same scale* both as a general and as a differential predictor. In fact, as argued in Chapter I, those scales which do not function as general predictors might well include the most promising differential predictors, and the results reported in Chapter IV suggest that the most significant interaction effects discovered in this project stem from personality scales which produced very low overall correlations with the criteria. Consequently, to compare the strength of those interactions reported in Chapter IV with that of the *a priori* scales used as general predictors, it will be necessary to compare the predictive validity of some scale X (a general predictor) with another scale Y (a differential predictor).

Specifically, let us ask the following question: if one were to arbitrarily choose the single *a priori* scale which produced the most significant interaction effect for each criterion, how would one's average predictions (using this scale plus knowledge of treatment assignment) compare to that achieved by simply choosing the single *a priori* scale with the highest average correlation across all treatments? That is, if we capitalize on chance and select the "best" interaction variable from the 350 scales scored in this project and then--capitalizing on chance once again--we select the "best" general predictor from the exact same set of *a priori* scales, how would the predictions using the differential predictor compare in validity with those based upon the general one? The results of precisely such a comparison are presented in Table 99.

Insert Table 99 about here

The values in Table 99 are the estimated correlations between scale scores and the three major criterion variables for all students in both experimental courses. The "best" general predictor of each criterion was selected (separately for the male and female samples) from among the approximately 350 *a priori*

Table 99

A Comparison between the Average Predictive Accuracy of General Predictors vs. Differential Predictors

		General Predictors	Differential Predictors	
Criterion	Sample	Largest Main Effect	Largest Q vs. P Interaction	Largest L vs. S Interaction
Course Satisfaction	Males	.22 (ESS: S-S)	.14 (RBI: Ext)	.16 (MMPI: R)
	Females	-.24 (WFPT: RC)	.15 (EPPS: nExh)	.15 (SVIB: Printer)
Course Achievement	Males	-.29 (PPR: Sp)	.16 (RBI: Foibles)	.23 (PPR: Sy)
	Females	.35 (ESS: Total)	.21 (CPRI: A-V)	.17 (SVIB: Agric.)
Non-graded Reading	Males	.24 (SSHA: SO)	.18 (MMPI: PHO)	.16 (SVIB: Nature)
	Females	.20 (SVIB: Ach)	.12 (EPPS: nAut)	.17 (SVIB: Milit.)

Note: -- The values in the table are the estimated correlations between scale scores and criterion measures for all students in both courses. The values for scales which functioned as general predictors are the average correlations across the four treatment conditions and the two courses. The values for the scales which manifested the most significant interaction effects are the estimated correlations for the total sample if the scale was used to make differential predictions. For an explanation of the procedure used to calculate the latter values, see the text.

personality scales--specifically excluding measures of aptitude and previous GPA. Had these latter measures been included, the validity of the general predictors of course achievement would have risen above .50 (see Tables 9 and 10 in Chapter III). The general predictors selected for Table 99 include those personality scales producing the highest average validity coefficients across all treatments and both courses. Consequently, the values of these correlation coefficients are likely to be over-estimates of their validity upon cross-validation. The particular *differential* predictors selected for the analyses presented in Table 99 are those *a priori* personality scales which manifested the most significant interactions with each criterion (see Tables 70 to 74 in Chapter IV). Thus, the general and the differential predictors were chosen from the same population of scale scores, and each set should be about equally biased in over-estimating the strength of their respective effects. The values in Table 99, then, are to be regarded as *relative*, rather than as absolute, indications of the strength of these effects.

Note that--for all possible pairs of comparisons between general and differential predictors--the general predictors produced the largest effects. If one were to make differential predictions for these criteria *using the most significant interaction effects*, in no case would one's resulting predictions be as valid as simply using a single general predictor (and thus ignoring all experimental variations in teaching methods). About twice as much criterion variance was predictable by the "best" of the general predictors as by the "best" of the differential predictors--in spite of the fact that the most powerful general predictors of one of the criteria were not included in these analyses! These poignant findings, when coupled with those from Chapter V concerning the fate of attempts to construct new empirical interaction scales, suggest that the significant interactions discovered in this project--even if replicated at the very same strength in future studies--are unlikely to lead to differential predictions which are more valid than those achievable by general predictors alone.

These are peculiarly embarrassing findings for proponents of the interaction hypothesis in college instruction. Yet, could any hypothesis which appears so intuitively reasonable be wrong? Before one even considers such a possibility, we should discuss those aspects of the present research project which could have served to attenuate the strength of genuine interaction effects.

Possible Sources of Bias or Error in the Experimental Procedures

In Chapter I, three hypotheses were proposed to account for the recurrent finding that differing instructional procedures do not show strong or consistent effects upon measures of course achievement. These three hypotheses (unreliable criteria, homogeneous experimental treatments, and interaction effects) might also be invoked to explain the findings from the present research project, and at least one more hypothesis (inadequacies in the personality measures) could be added. Let us consider each of these potential sources of invalidity in turn.

The Course Outcome Variables

Three major classes of criterion variables were assessed in this project, each class measured by multiple methods: (a) course achievement (measured by two different multiple-choice content examinations administered five weeks apart, plus an integrative essay examination); (b) course satisfaction (measured by three independent items embedded in a Course Evaluation Questionnaire which was administered under confidential conditions at the very end of the term); and (c) amount of non-graded reading (measured both by a direct question on the Course

Evaluation Questionnaire, and by a multiple-choice examination covering the content of the non-graded reading materials and administered after the final course examination). These particular variables include that criterion most often utilized in previous studies of college instruction (course achievement), that criterion which on *a priori* grounds seemed the most reasonable candidate for manifesting interactions with personality variables (course satisfaction), and finally a relatively novel criterion which was selected to measure some potentially more subtle aspects of the instructional process (amount of non-graded reading). While the wisdom of this choice is certainly open to question, it is not obvious that the criterion classes are grossly inappropriate to the goals of this research program.

Nonetheless, even readers who accept these three criteria as reasonable ones may lament the measures used to assess them. Multiple-choice (and essay) tests and self-report questionnaires certainly *do* pose measurement problems, in spite of all of the explicit efforts to make them as precise and reliable as possible. Readers can assess the adequacy of the rating scales by re-examining Table 4 in Chapter II. The complete Course Evaluation Questionnaire is included in this report as Appendix B, and all of the examination questions are available from the author. Skeptical readers may also wish to re-examine Tables 5 and 6 in Chapter II, which present the means, standard deviations, intercorrelations, and factor structure of the various criterion measures. The findings displayed in those tables demonstrate that the correlations among the measures, and the resulting factor structures, were virtually identical in each of the two experimental courses.

Somewhat surprisingly, however, these same tables show that the three major criterion variables were independent of each other. While this finding permitted the assessment of three orthogonal criteria (a fortunate finding on purely experimental grounds), it seems paradoxical that individual differences in achievement, satisfaction, and amount of extracurricular reading should not show considerable intercorrelations. Nor is this finding simply an artifact of an orthogonal factor rotation. Factor scores were computed for each student on the first principle component of the multiple measures of each criterion variable. separately, and the intercorrelations among these three experimentally independent component scores were all nearly zero. Moreover, a careful examination of the three bivariate scatter-plots of these factor scores revealed no obvious departures from multivariate normality.

However, any critics of the criterion variables can focus on at least two unexpected findings: (_a_) three intuitively related dimensions turned out to be virtually orthogonal, and (_b_) the criterion variable which should be most likely to produce significant interactions with personality attributes (course satisfaction) turned out to produce relatively few--and relatively small--ones. The fact that satisfaction and achievement are independent criterion dimensions is neither unique to these particular college courses, nor even restricted to college courses generally. For example, in an Introductory Sociology course at the University of Oregon (_N_ = 249), the correlation between scores from a multi-item measure of course satisfaction and those from a two-hour multiple-choice final examination was only .07. Such results are reminiscent of those found in industrial settings, where morale (satisfaction) and productivity (achievement) are typically quite independent dimensions.

The second paradoxical finding, that course satisfaction was not a particularly potent source of personality interactions may be more difficult to explain. While one obvious possibility is that there was little individual variation on the satisfaction measures (i.e., that virtually all students were very satisfied, or all very dissatisfied, with their particular teaching condition), two lines of evidence rule out this hypothesis. A one-item course satisfaction measure ("The Morale Thermometer") was administered under conditions of complete anonymity every two weeks throughout the term to students in both experimental courses. While the mean satisfaction scores showed a steady decline throughout the term (a finding in no way unique to these two courses [see Rayder & Neidt, 1964]), the variance of these scores increased over time. For every one of the six administrations of this satisfaction index (including the last administration at the end of the term), student responses spanned the entire range of the nine-category rating scale. The three course satisfaction items from the Course Evaluation Questionnaire (see Table 4 in Chapter II) also showed this same range of individual differences; at least some students responded in every category on each of the three rating scales.

Some additional confirmation of the great range of individual differences in course satisfaction can be found in the responses to an open-ended question appended to the Course Evaluation Questionnaire. The following quotations might prove convincing to even the most skeptical reader:

Course A:

High Satisfaction

> I liked the four quizzes very much. . . . Good evaluation methods. . . . Good high quality lectures.
>
> I was very pleased to be in the self-study group, and found it to be a more productive method than those used previously. . . . On the whole, I was most pleased with the course.
>
> I enjoyed not having to attend lectures and I still feel I profited from the course. I tended to really learn the reading material so I could write a good paper. When the exam was due, I found that a vigorous review was sufficient to make me feel confident of the material. Good course!

I liked the way this course was handled. It gave the student the opportunity to express his ideas and feelings.

I liked this experience in learning. At first, it was a challenge to know that I was completely on my own. What I put into the course was the only factor determining what I got out of it.

Course A:

Low Satisfaction

This course was the most unprofitable course I have taken at the University. I have learned absolutely nothing, and I don't feel it is my fault. . . . This entire experience has been . . . destructive to my college career and I won't take another course, in fact I intend to discourage others from taking courses, from your silly-assed department!

There is absolutely nothing I like about this class! . . . I disliked the course, the sections, the grading, and the whole idea.

I didn't need it at all. A waste of time and money, without any increase in knowledge.

This course could be improved by blowing it off the map. . . . I signed up . . . to learn something about the subject, but so far all I've done is tell you about my day, my sex life, and what I had for breakfast.

Course B:

High Satisfaction

The course was extremely valuable from a practical standpoint. It will help us not only understand others, but realize more about ourselves.

On the whole I enjoyed the course. I feel self-study is the only way we truly learn.

I felt, on the whole, that the course was a very valuable one . . . I would like to compliment Dr. . . . on his lectures. I highly enjoyed them and found him a stimulating lecturer.

I liked the course because I found it very interesting. It was a new way in which to study . . . and provided a new type of learning experience. The papers were another thing I enjoyed as I like writing and being able to integrate some of the reading material into a paper, thereby gaining a better understanding of the material.

Course B:

Low Satisfaction

This class was without a doubt the most complete waste of time in the history of Western culture.

A nasty course devised to harass youth. No method, no technique, no direction.

This is the biggest farce and waste of students' time, energy and money.

This course was the worst class that I have had in two years at the University. I have gained very little from this class.

I feel that this course was a complete waste of time. . . . I wish I hadn't taken it. . . . I wasted my time on this course and I haven't learned a thing!

In summary, while the course outcome variables used in this project certainly could be improved, it seems unlikely that problems in criterion measurement were gross enough to severely attenuate the strength of genuine interaction effects. Consequently, let us consider some other hypotheses to account for these findings.

The Experimental Treatment Conditions

Experimental variations in "instructor input" (Lecture vs. Self-study conditions) and in "student output" (Quiz vs. Paper conditions) were combined to form the four-fold experimental design displayed in Table 1 of Chapter II. Obviously it would be difficult to argue that these four treatments cover the entire range of college instructional variations or that this particular experimental design is in any sense optimal for the encouragement of powerful interaction effects. On the other hand, the differences in "learning environment" provided those students given traditional lectures and frequent quizzes (the LQ sections of the design) vs. those on a completely self-study regime in which integrative essays were required (the SP sections) are probably about as disparate as are usually encountered in most institutions of higher learning. Moreover, while the LQ vs. SP sections were originally conceptualized as providing variation on the dimension of "structuredness," these two teaching conditions seem reasonably congruent with the two major "instructional presses" (extrinsic vs. intrinsic) which have recently been proposed as a major source of differences between college courses. In the words of Siegel and Siegel (1967):

"We believe that the patterns of main effects obtained in particular courses enable us to differentiate between extrinsic and intrinsic presses. When performance is highly dependent upon instructor-environment conditions, we have evidence for an extrinsic instructional press. Conversely, when performance is particularly dependent upon learner characteristics, we have evidence for an intrinsic press. . . . An extrinsic instructional press sensitizes students to the potentially punitive and threatening (i.e., inhibiting) aspects of the instructional environment; an intrinsic instructional press sensitizes students to the potentially supportive (i.e., facilitating) aspects of the instructional environment" (p. 323). From the above quotation, one might assume that students in the LQ sections experienced a relatively "extrinsic" press and students in the SP sections experienced a relatively "intrinsic" one. In any case, there should be _some_ salient instructional differences between these two extreme treatment conditions, and therefore some types of trait-by-treatment interactions might reasonably be expected to occur.

On the other hand, one aspect of the present experimental procedures may have served to vitiate those instructional differences expected on _a priori_ grounds. Students in all treatment conditions were required to complete an extensive set of personality inventories, and the sheer existence of this common task might have masked the major treatment variations. It is possible that the personality assessment tasks (which were rather unusual additions to the standard academic bill of fare) may have been perceived by many of the students as a far more salient aspect of their course experience than the presence (vs. absence) of lectures or the use of quizzes (vs. papers). It would be ironical if those very aspects of the project which make it unique (the inclusion of a reasonably comprehensive set of personality measures) served to attenuate the impact of the experimental treatments with which these measures were to interact! Future investigations could strengthen the credibility of this conjecture by replicating the study (confining personality measurement to one inventory) and finding a similar pattern of interactions with greatly increased strength of effects. In the interim, however, let us consider some other explanations for the present findings.

Interactions with Sex, Course, and Other Factors

The third major hypothesis invoked to explain the typical lack of instructional differences posits the existence of trait-by-treatment interaction effects, and it was this hypothesis which led to the present experimental procedures. If powerful trait-by-treatment interactions actually characterize the college instructional process, then the broad band-width measurement strategy used in the present project should have uncovered some of these effects.

On the other hand, just as the interaction hypothesis itself is a more complicated rationale than one based solely on main effects, so one might now argue that an even more complicated model is needed to explain the present findings. Specifically, the results based upon the a priori scales indicated that interaction effects found in the male sample rarely held for females, and consequently that some form of "sex-by-trait-by-treatment" interactions need be invoked. Moreover, an even more powerful factor in the present project was one treated as experimental error, namely differences between the two courses. If this study had been limited to either course alone, the results would have looked dramatically different. For each course, the number of significant interaction effects far exceeded the number to be expected by chance, and many of these effects were of quite substantial size. Unfortunately, the most significant interaction effects rarely replicated across courses, and thus these large single-course interactions generally have not been included in the present report. Studies limited to one course would have treated such effects as genuine ones and would therefore have concluded that the interaction hypothesis in college instruction was clearly confirmed.

One example might make this point more clear. For the male students in Course A, the CPI factor scale Serenity-Depression (*fSe*) produced correlations with the course satisfaction criterion of +.26 and -.36 in the Quiz ($N = 89$) and the Paper ($N = 71$) treatments, respectively. However, this highly significant interaction ($Z = 3.96$; $p < .001$) was not replicated in Course B, where the corresponding correlations were -.04 and -.02. While such effects have been relegated to "error" in the present analyses, a strict determinist would have to insist that they are instances of a "sex-by-trait-by-treatment-by-course" (four-way) interaction. Obviously, even more complicated interaction effects can be hypothesized, including some which could involve combinations of traits (i.e., more than one personality scale) rather than any one alone.

The Personality Measures

More parsimonious explanations for the present findings might well focus on problems involving the measures used to assess the personality traits. Table 2 in Chapter II lists those inventories and other measures which were administered in this project, and Tables 11, 16, 21, 23, 25, 31, 36, 39, 43, 48, 52, 55, 58, and 63 in Chapter IV present the scales which were scored from each of them. The measures were selected on the basis of four criteria: (a) feasibility, (b) objectivity, (c) content relevance, and (d) comprehensiveness.

All of the personality measures were paper-and-pencil inventories suitable for group administration. Since the sample included over 800 students and since research funds were limited, all individually-administered instruments were eliminated from consideration (no matter how desirable they might be on other grounds) simply on the basis of administrative feasibility. Moreover, group-administered projective techniques and other "open-ended" measurement procedures were eliminated in favor of response-constrained structured inventories, simply to circumvent the enormous scoring problems associated with the former and thus to provide reasonably objective scores (i.e., those with near perfect inter-investigator scoring agreement). Within the limits set by the criteria of feasibility and objectivity, those inventories (or single scales) whose item content appeared especially relevant for the task of producing interactions with differing college instructional formats were included in the battery (e.g., the Educational Set Scale, the Survey of Study Habits and Attitudes, the Oregon Instructional Preference Inventory, and such scales as those purporting to measure originality, test anxiety, need for achievement, locus of control, and dogmatic attitudes).

Finally, an attempt was made to include in the test battery: (a) quite diverse item content, including statements about beliefs and attitudes (e.g., CPI, MMPI, EPPS), adjectival trait-descriptions (ACL), vocational and avocational activities (SVIB), specific instances of past behaviors (RBI), and artistic line drawings (WFPT); (b) some variability in response mode, including "True-False" options (e.g.,CPI, MMPI, ACL, CPRI), "Like-Dislike" preferences (e.g., WFPT, ESS, SVIB), forced-choice alternatives (e.g., EPPS, OIPI, CCPI), and various rating or ranking procedures (SSHA, BSAS, ESS, PPR); and (c) reasonably comprehensive coverage of the major personality dimensions tapped by existing structured inventories and questionnaires. Excluded from the battery were all measures of aptitude, achievement, and "cognitive style" (except the two SAT scores which were already available for this sample). Future investigators might well include a battery of aptitude measures, plus any new personality inventories which were not available when the present study was planned (e.g., Jackson's Personality Research Form and the Edwards Personality Inventory).

The present assessment battery posed a number of potential problems, each of which could have interfered with the attempts to discover trait-by-treatment interaction effects. These problems can be grouped into two major classes: (a) data reliability, and (b) response invalidity; and each will be discussed in turn.

Problems in data reliability. The battery of personality inventories completed by the 800-900 students in this project yielded more than two million individual item responses. These responses had to be transferred from the inventory answer sheets to IBM cards and then tallied by computer to produce test scores, each of which was then analyzed in the many ways already detailed in this report. This long data analysis chain permitted a number of errors to be introduced at each stage, and consequently the reader may well wonder how accurately the present findings mirror those based upon a perfect reproduction of the original item responses. While it would be inappropriate to detail the myriad procedures used in this project to insure the faithful reproduction, transfer, and storage of the original item responses and the resulting scale scores, a few of these steps should be mentioned briefly.

The item responses from each protocol were converted to punch cards by an optical scanner on two separate occasions, and the resulting two sets of cards were mechanically compared; all discrepancies were resolved by reference to the original answer sheet. Later, the computer tapes containing the item responses for all subjects on each inventory were listed, and a pair of clerical workers checked the accuracy of each response by comparing--item by item--the original answer sheets with the computer listings. Finally, virtually all data analyses were carried out independently using different computer programs and different computers, and the results were compared. While it would be foolish to suppose that the results presented in this report are all of perfect accuracy, it is extremely unlikely that problems of data reliability seriously corrode the strength of the effects which have been discussed.

Response invalidity. Even if all of the problems relating to data reliability were eliminated, readers might still question the validity of the responses made by subjects exposed to such a long, and potentially tedious, set of assessment procedures. A number of lines of evidence tend to lower the probability that the present findings stem in any large part from problems of response validity. In the first place, a careful examination of the means, standard deviations, and intercorrelations among the inventory scale scores do not reveal evidence either of large systematic biases or of large amounts of quasi-random error. Systematic errors (e.g., response sets) should tend to raise the mean scores on putative measures of these effects and to change the correlational pattern of other inventory scores. Non-systematic (quasi-random) errors should tend to lower score variances, to raise (or lower) mean scores towards the "chance" level, and to attenuate the correlations among independently-keyed scores. None of these effects is particularly characteristic of the present data.

Moreover, a number of analyses--both within each inventory and across inventories--also tend to reject the hypothesis that the inventory responses were of particularly poor quality. One question on the Course Evaluation Questionnaire (administered under confidential conditions at the very end of the term) asked directly: "How honestly did you fill out the inventories?" The proportion of students responding to each of the four response options was as follows:

(1) I filled out each inventory as candidly as I could (71%);

(2) I filled out most of the inventories honestly, but a few a bit less so (22%);

(3) I goofed around on some of the inventories (6%);

(4) I goofed around on almost all of the inventories (1%).

For some of the inventories, all interaction analyses were computed separately on the subsample of subjects who indicated that they completed the inventories as candidly as possible (Alternative 1 above). The results from these analyses were compared with those based upon the total sample. If lack of candor were an interaction attenuating factor and if the 71% of the students who claimed candor actually produced more valid responses than the others, then the interaction effects should have been stronger in the "most candid" subsample than in the total sample. They were not.

On the other hand, it is possible that the students were less than perfectly candid in their responses to the Course Evaluation Questionnaire itself. Consequently, for each inventory a "deviancy vs. commonality" scale was constructed by selecting items with an extreme response imbalance (e.g., a large proportion of the sample responding to the same response alternative) and keying those items in the direction of a statistically deviant response. Students responding in any sort of quasi-random fashion would achieve high scores on such scales. For a number of inventories, interaction analyses were computed separately on the subsample of subjects who received low scores on these scales, and the results from these analyses were once again compared with the results based upon the total sample. If the presence in the sample of quasi-random responders were seriously attenuating the strength of the interaction effects, then these effects should have been stronger in the "low deviancy" subsample than in the total sample. Again, they were not.

Some across-inventory analyses also provided evidence which diminishes the likelihood of a purely response quality interpretation of the present findings. The interaction effects based upon inventories such as the OIPI, which were administered early in the term (when the students--who did not anticipate a lengthy battery of measures--could be expected to be most careful in their responses), can be compared with those from inventories such as the SVIB, which were administered much later in the term. And, interaction effects based upon inventories administered in class (e.g., the OIPI, SSHA, WFPT, and SVIB) can be compared with those based upon inventories which the students completed at home (e.g., the CPI, ACL, RBI, EPPS, and MMPI). If response quality were an important moderator of the strength of the interaction effects, then (other things being equal) the former inventories should have produced stronger effects than the latter ones. The OIPI, which was the very first inventory and which was administered in class, should have shown unusually strong interaction effects (which it did not). All of this evidence, while certainly not conclusive, does reinforce the belief that problems in response validity have not grossly attenuated the strength of the interaction effects.

Moreover, any serious problems of data reliability or response validity should have served to attenuate the strength of general predictors as well as that of differential (interactive) ones. Since the comparisons presented in Table 99 are meant only as *relative* indications of the respective strengths of main vs. interaction effects, it still seems safe to assert that new predictions made on the basis of the most significant interaction effects are unlikely to be more valid than those made on the basis of general predictors alone. Clearly, it is the task of future investigators to confirm or reject this heretical assertion.

Chapter VII

SUMMARY

Chapter I: THE PROBLEM

Over the years, in a continued effort to improve the practice of higher education, a number of investigators have attempted to assess the differential effects of various teaching procedures upon student achievement in college courses. With relatively few exceptions, the overwhelming finding that has emerged from hundreds of such studies is that differing college instructional procedures do not appear to produce any consistent differences. At least three hypotheses have been proposed to account for this general finding. In the first place, it may be that most of the failures to find differences between teaching conditions have foundered on the shoals of crude criterion measures; perhaps all instructional techniques differentially affect students to some degree, but present instruments simply are not sensitive enough to detect these subtle influences. A second hypothesis points an accusing finger at the teaching methods themselves; previous studies may simply have failed to include any radically different types of instructional formats.

A third explanation for the failure to find significant differences invokes the assumption that there is an interaction between teaching methods and characteristics of the learner, and that the techniques which are the best for some students may be the worst for others. Studies of the interaction hypothesis within the context of college instruction date back at least two decades, although only recently have there been any concerted efforts to explore this hypothesis in a systematic manner. Unfortunately, most efforts to demonstrate trait by teaching method interaction effects have not been successful.

Why has so appealing an hypothesis borne such fragile fruit? One possible explanation is that virtually all previous studies of college interaction effects have utilized only a few personality measures, and these typically have been selected because of their easy availability or because of their previously demonstrated value as general predictors. However, those measures which have gained the widest currency as general predictors are the least likely candidates for being good differential (or interactive) ones. What is needed, therefore, is an extensive search for precisely those measures which, while not showing great promise as general predictors, turn out to be consistently associated with interaction effects. That is, if powerful interactions between course treatments and some student personality traits actually exist in nature, then it is time to try a broad-band search to find measures of such traits. Two tactics may prove necessary. First should come a systematic empirical sweep through already-existing personality measures to mine off the most promising interaction variables. However, if the existing lode appears to be empty, then new measures may have to be developed with this specific goal in mind. These are precisely the twin aims of the present research project.

Chapter II: PROCEDURES

The general goal of this research program was to discover those personality characteristics which differentiate college students who tend to learn more effectively from one instructional format than from some other, so that ultimately instructional procedures can be more optimally aligned with individual differences among students. Two college courses were studied concurrently and four different teaching conditions were utilized in each course. A comprehensive battery of structured personality inventories was administered to each of the students, and three types of criterion measures were collected in both courses. Of the 892 students initially electing either of the two courses, complete criterion data were available for 806, the sample used in most of the data analyses.

Students in each of the two experimental courses were assigned on a non-systematic basis to one of four types of instructional formats. These experimental treatments included two forms of instructor "input" (traditional lectures vs. self-study instruction) and two forms of student "output" (multiple-choice quizzes vs. integrative papers), combined to form the four cell experimental design displayed in Table 1 (page 14a). Within each course, all students in the Lecture condition met together to receive formal lectures twice a week, while students in the Self-study condition had no such class meetings. Both groups, however, met in small sections for one hour a week. Students in the Quiz sections were administered four multiple-choice quizzes during the quarter, spaced approximately two weeks apart. Concurrently, students in the Paper sections were required to write four integrative essays during the quarter. Quiz and paper scores both contributed the same amount to the final course grade.

While the experimental design for this project allowed a comparison between lecture vs. self-study methods and between quizzes vs. papers, it also permitted an examination of the joint effects of these two aspects of college teaching as scaled on a potentially more general dimension of college instruction: the degree of structure provided by the instructional format. Ordered on this dimension, the Lecture-Quiz sections clearly provided the most structure, while the Self-study-Paper sections were probably as unstructured as are likely to occur at the undergraduate level. Therefore, the differential effects of teaching methods located near the two poles of the structured vs. unstructured dimension could be assessed.

The major innovation of the present study over previous ones lay in the administration of a comprehensive battery of personality inventories, in order to discover any interactions between student personality characteristics and the instructional treatments. These personality measures were chosen (a) to include those scales which appeared to show any relevance as potential interaction variables, and (b) to span as broadly as possible the range of personality traits presently measured by paper-and-pencil questionnaires and inventories. These measures are all listed in Table 2 (page 17a).

Three general types of criteria were multiply assessed in both of the experimental courses: (a) knowledge of course content, (b) the amount of extracurricular (non-graded) reading that the students carried out, and (c) students' satisfaction with their instructional treatment. Two content examinations were administered in each course, one approximately half-way through the term, and the other at the end of the course. The second examination included an integrative essay, in addition to 60 multiple-choice questions. Thus, both divergent thinking (as measured by an essay) and convergent thinking (as measured by two multiple-choice examinations) were available as measures of the course achievement criterion.

The only unique criterion to be employed in this project was one assessing the extent to which students read relevant material which, while available to everyone, was explicitly understood as not involved in the determination of the cours grade. Multiple-choice questions were written so as to be quite easy for anyone who had read the material, while simultaneously being quite difficult for anyone who had not read it; scores on the resulting test provided relatively precise information on the extent to which each student had read this extra material. In addition, one of the questions on the Course Evaluation Questionnaire, administered at the end of the term, asked the students to indicate directly the amount they had read.

This latter 42-item questionnaire also included rating scales tapping student attitudes toward different aspects of the course. Four of these questions, along with four achievement test scores (scores from the first examination, the multiple-choice portion of the second examination, the essay portion of the second examination, and the special questions from the second examination covering the content of the non-graded reading) were intercorrelated, separately in the two courses. These two correlation matrices were factor analyzed, using both a principle factors and a principle components solution, each of which was rotated by one oblique and two orthogonal procedures. The data turned out to be so cleanly structured that all solutions gave quite similar results, and the factor structures were virtually identical in the two courses. Factor scores were computed for each student in each course, and three factor scores (course achievement, course satisfaction, and amount of non-graded reading)--plus the essay and the multiple-choice subscores from the second examination--were used as the five major outcome variables in all of the subsequent analyses. These five criteria, then, include three measures of course achievement (a multiple-choice examination score, an essay examination score, and the overall achievement factor score), one global measure of course satisfaction, and one measure of non-graded reading.

The correlations between each scale score and each of the five outcome variables were computed separately for the male and the female students within each of the four cells of the experimental design. In addition, similar correlations were computed for the students in each of the four experimental treatments (Lecture [L], Self-study [S], Quiz [Q], and Paper [P]). The differences between the correlations for students exposed to (a) the most structured (Lecture-Quiz) vs. the least structured (Self-study-Paper) sections, (b) the Lecture vs. Self-study treatments, and (c) the Quiz vs. Paper teaching conditions were tested for statistical significance, and the significant interaction effects are presented in Chapter IV.

Chapter III: ANALYSES OF THE MAIN EFFECTS

Two major classes of main effects were considered, namely those stemming from the experimental treatment conditions (the teaching methods) and those stemming from the personality characteristics of the students themselves. The effects of the experimental variations in teaching methods on each of the five outcome variables were examined by means of analyses of variance, and by point-biserial correlations between the students' instructional format and their scores on the criterion variables. These analyses are presented in Table 7 (page 28a). The experimental treatment variations did not produce any statistically significant main effects common to both of the two courses. All treatment effects were either non-significant in both courses (nine out of 15 analyses), significant in one but not the other course (five analyses), or significant in both courses but opposite in direction of effect (one analysis). Consequently, these results generally confirm the findings from past studies that differences in instructional conditions do not show any sizable or replicable main effects.

The correlations between the criterion variables and various student attributes were virtually identical in both courses. Sex, class in college, and initial course motivation had essentially zero correlations with each of the five outcome variables. On the other hand, previous college GPA and two measures of scholastic aptitude were related to the three course achievement variables, and a number of these relationships were of quite substantial size. In general, GPA correlated more highly with the course achievement criteria than did the SAT-Verbal score, which in turn was more predictive of these variables than was the SAT-Mathematical score. These findings generally confirm those from previous studies, showing that a substantial proportion of the variance in achievement is predictable by student attributes, and virtually none by instructional treatments.

Chapter IV: ANALYSES OF THE INTERACTION HYPOTHESIS: THE A PRIORI SCALES

The first tactic for discovering any significant interactions between course treatments and student attributes involved a broad band-width pass through more than 350 personality scale scores. Since the three major outcome variables (the course satisfaction, course achievement, and non-graded reading factor scores) were independent of each other, it was possible to compare the number of significant interactions obtained using these three criteria with the number obtained when three sets of random normal deviates were used instead. The ratio of obtained significant interactions to that expected by chance was only 4 to 3. Since a substantial number of the significant interaction effects could have arisen by chance alone, the reader must be cautioned against accepting these results before they have been replicated. The present findings should be considered only as clues or hypotheses to guide future investigators to the most promising source of potential interaction variables.

Table 70 (page 65a) summarizes the significant interactions between personality scales and the course satisfaction outcome variable. For this criterion, there were roughly three times as many interactions involving the Quiz vs. Paper comparison as the Lecture vs. Self-study one, and roughly three times as many significant interactions found for females as for males. Table 71 (page 66a) summarizes the most significant interactions with the course achievement factor score. In contrast to course satisfaction, significant interactions with course achievement were about equally prevalent for male and female students, and there were approximately three times as many significant interactions involving the Lecture vs. Self-study comparison as the Quiz vs. Paper one. Table 72 (page 66b) summarizes the significant interactions with the non-graded reading outcome variable. Personality scale interactions with this outcome variable were found more often for female than for male students, and more often for the Lecture vs. Self-study comparison than for the Quiz vs. Paper one. Interactions with the multiple-choice test score were generally similar in pattern and in magnitude to those from the course achievement factor score. The few cases where there was any substantial difference between the interactions with these two achievement criteria are summarized in Table 73 (page 67a). Finally, the significant interactions with the essay test score are summarized in Table 74 (page 67b).

In general, for each of these five criteria and each of the two major variations in experimental teaching conditions, some 350 a priori personality scales produced a few dozen significant interaction effects. All of these interactions could have arisen by chance alone, and none of them were truly large in magnitude. Moreover, the one measure which was previously constructed specifically as an interaction variable (Siegel and Siegel's Educational Set Scale) failed to function in that role in the present study. These results can hardly be interpreted as providing overwhelming support for the interaction hypothesis.

Chapter V: ANALYSIS OF THE INTERACTION HYPOTHESIS: THE NEW EMPIRICAL INTERACTION SCALES

The results reported in Chapter IV are of ambiguous scientific import, since the number of significant interactions using a priori personality scales was not substantially greater than the number which might be expected by chance alone.

Moreover, the relatively modest size of the significant correlational differences should produce no warming glow in the hearts of proponents of the interaction hypothesis. While some of the experimental procedures used in this project may have attenuated the strength of genuine interaction effects, it is possible that present personality scales are simply poor candidatss for an interactive role. Since scales constructed for the purposes of general prediction may by their very nature exclude the sort of personality variance most important in differential prediction, new measures were constructed for this very purpose.

Two treatment conditions were chosen for the development of empirical interaction scales: the Lecture-Quiz and the Self-study-Paper sections in each of the two courses. This choice was based on the assumption that these two experimental treatments provided the most psychologically disparate teaching conditions, and consequently that scales constructed to interact with these two instructional treatments should have maximal utility in future studies. Each of the items from seven personality inventories was correlated with each of the five criterion variables, separately within the Lecture-Quiz and the Self-study-Paper sections of each of the two courses. The seven inventories used in these analyses included the CPI (480 items), ACL (300 items), EPPS (225 items), ESS (93 items), SSHA (75 items), RBI (250 items), and OIPI (84 items).

For each inventory and each of the five criteria, those items which produced significant differences between the correlations in the Lecture-Quiz sections and the correlations in the Self-study-Paper sections of one course were included in an interaction scale; these items were keyed such that the correlations in the Self-study-Paper condition were more highly positive than the correlations in the Lecture-Quiz condition. This procedure yielded two interaction scales (one from each course), each of which was cross-validated on the students in the other course. In addition, those items which manifested statistically significant correlational differences between the two treatments across both courses were used for the construction of a set of "cross-validated" interaction scales. These latter scales cannot be further cross-validated in the present project, and therefore they await independent confirmation in other investigations. The item number and the keying direction for the items in all of the cross-validated scales are presented in Appendix A.

Of the 20 single-course interaction scales constructed from the CPI item pool, only six (30%) cross-validated in the predicted direction. Of 10 such RBI interaction scales, only four (40%) cross-validated in the predicted direction. On the other hand, 100% of the ACL interaction scales, 80% of the OIPI interaction scales, and 67% of the EPPS interaction scales cross-validated in the predicted direction--though only a very few of the cross-validities were statistically significant. Contrary to initial expectations, the course satisfaction outcome variable turned out to produce the least promising--and the non-graded reading criterion the most promising--interaction effects; 42% of the scales constructed from the course satisfaction criterion, 64% of the scales constructed from the course achievement criterion, and 83% of the scales constructed from the non-graded reading criterion produced cross-validated correlational differences in the predicted direction.

Neither the reliabilities nor the convergent validities of the "cross-validated" interaction scales were particularly promising. While 83% of the reliability coefficients--and the same proportion of the convergent validities--were positive, the values of these coefficients were generally quite small. Moreover, the low convergent validity values for different interaction scales constructed from the same criterion suggest that a composite scale made up of items from all of these inventories would also possess rather low internal consistency. These findings, while obviously not conclusive, do not bode well for the generality of the empirical interaction scales. Nonetheless, this crucial question cannot be settled until the scales are used in further experimental investigations.

In general, then, scales specifically constructed as interaction variables based upon the responses of students in one course did not produce statistically significant correlational differences when the scales were cross-validated on students in the other course. Moreover, items which produced significant correlational differences across both courses were relatively rare, and the scales constructed from these items, while producing large correlational differences, showed low internal consistency and low convergent validity. While it is apparent that these latter scales must be further validated in other college courses, the findings from the present project provide no firm basis for expecting them to have wide generality.

Chapter VI: SITUATIONS AS MODERATOR VARIABLES: A DISCUSSION OF THE FINDINGS

While the historical roots of the trait-by-treatment interaction hypothesis are deep ones, some current developments in psychology make their study of particular contemporary significance. The veritable explosion of interest in the technology of "behavior modification" and in the search for a "social learning theory" has led to a rejection of the classical psychometric assumption of enduring personality attributes, in favor of a strictly situational stance toward personality prediction. Proponents of modern social learning theory appear to be proposing that different situations (each of which permit roughly the same variation of behaviors in some significant response class) produce radically different rank orderings of subjects on the level of behaviors in that class. If this is indeed the case, situations might be conceptualized as "moderator variables" for the relationships between personality characteristics and these overt behaviors, and predictions involving knowledge of both situations and personality test scores should be superior to those made on the basis of either one alone. Specifically, if powerful attribute-by-treatment interactions actually characterize the college instructional process, then differential predictions of course outcomes (utilizing knowledge of these interaction effects) should be superior to predictions based solely on main effects. The present research design permitted a direct test of this hypothesis.

In order to gauge the strength of the significant interaction effects presented in Chapter IV, the validity of the predictions based solely on general predictors was compared with the validity of predictions made on the basis of the most significant interaction effects (i.e., taking into account both the treatment condition to which the student was assigned and his scores on the personality scale which produced a significant interaction). The single *a priori* scale which produced the most significant interaction effect for each criterion was compared with the single *a priori* scale with the highest average correlation across all treatments. That is, capitalizing on chance and selecting the "best" interaction variable from the 350 scales scored in this project, then capitalizing on chance once more and selecting the "best" general predictor from the exact same set of *a priori* scales, the validity of the predictions using the differential predictor was compared with that based upon the general one. The results of such a comparison are presented in Table 99 (page 91a). Since the general and the differential predictors were chosen from the same population of scale scores, each set should be about equally biased in overestimating the strength of their respective effects, and therefore the values are to be regarded as *relative*, rather than absolute, indications of the strength of the two types of effects.

For all possible pairs of comparisons between general and differential predictors, the general predictors produced the largest effects. If one were to make differential predictions for these criteria using the most significant interaction effects, in no case would one's resulting predictions be as valid as simply using a single general predictor and thus ignoring all experimental variations in teaching methods. About twice as much criterion variance was predictable by the best of the general predictors as by the best of the differential predictors, in spite of the fact that the most powerful general predictors of one of the criteria were not included in these analyses. These poignant findings, when coupled with those in Chapter V concerning the fate of attempts to construct new empirical interaction scales, suggest that the significant interactions discovered in this project--even if replicated at the very same strength in future studies--are unlikely to lead to differential predictions which are more valid than those achievable by general predictors alone.

These are peculiarly embarrassing findings for proponents of the interaction hypothesis in college instruction. Consequently, those aspects of the present research project which could have served to attenuate the strength of genuine interaction effects were highlighted and discussed. Specifically, possible validity-attenuating factors in the criterion variables and in the experimental treatments were evaluated, and the possibility of higher order interactions was considered. The most likely source of bias in the present study stems from the personality measures, and possible problems of data unreliability and response invalidity were considered in some detail. However, any serious problems of this sort should have served to attenuate the strength of general predictors as well as that of differential (interactive) ones. Since the comparisons of general vs. differential predictors were meant only as relative indications of the respective strengths of the two kinds of effects, it still seems safe to assert that new predictions made on the basis of the most significant interaction effects are unlikely to be more valid than those made on the basis of general predictors alone. Clearly, it is the task of future investigators to confirm or reject this heretical assertion.

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Epilogue

The following poem was written by J. Craig Mathiesen, a student in one of the two experimental courses; it appeared in the May 19, 1965 issue of the Oregon Daily Emerald, the student newspaper at the University of Oregon. "Psychology 204" was the course number used for both experimental courses, and "Condon Hall" housed the Psychology Department at the University.

204

Once upon a Spring day dreary
As he registered, weak and weary,
IBM cards crammed in pockets, people crowded in a door.
Suddenly amidst his sweating,
Negligence he began regretting.
A science requirement caused the fretting, forgotten heretofore.
Amidst directions, lines and more,
He had to take Psych 204.

Not everything would be so bad,
If all were normal in that pad
That innocently lies haunting, in darkness behind Condon's door.
Enough to start a strong man yearning,
A giant experiment in learning.
Students trapped and overrun. Innocent Belgiums of the War.
If only they had known before, what instructors had in store.
Pity those in 204.

Classes all shall be divided,
Fiendish minds behind decided.
It's called "Find what makes students tick and write a book to get
   rich quick," or,
"Four papers here we will require,
Quizzes there we do desire."
Pay no heed to time demanded, for those are fortunes of the war.
Students, like soldiers on a bloody shore, for their country do no more.
What is this course, Psych 204?

Collegiate guinea pigs are the best,
So the Department hands out tests.
The CPI, MMPI; this and that, and that and more.
Makes no difference how perplexed,
Students are of course's text.
Apply special pencils to this test. Grab that one as you go out the door.
Personality inventories are so enlightening.
Quoth the student, "Lord! One more?"

Appendix A

Item Number (and Keying Direction) for Items in the New Empirical Interaction Scales

California Psychological Inventory (CPI)

CPI SAT-X (13 items)

True: 34 124 164 350 358

False: 3 116 118 168 239 300 326 410

CPI ACH-X (14 items)

True: 86 99 179 240 251 336 350 393 403 448

False: 83 128 227 373

CPI NGR-X (11 items)

True: 189 440

False: 77 135 143 210 233 266 322 412 435

CPI MC-X (8 items)

True: 350 440

False: 77 81 234 250 351 457

CPI ESY-X (17 items)

True: 15 123 153 179 224 240 295 306 380 389 442 448

False: 178 233 250 288 302

Oregon Instructional Preference Inventory (OIPI)

OIPI SAT-X (3 items)

True: 40 48

False: 11

OIPI ACH-X (6 items)

True: 44 64 67 74

False: 5 72

OIPI NGR-X (4 items)

True: 51 53

False: 13 22

OIPI MC-X (6 items)

True: 44 45 47 58 67

False: 25

OIPI ESY-X (4 items)

True: 67

False: 37 54 76

Reported Behavior Inventory (RBI)

RBI SAT-X (6 items)

True: 63 112

False: 54 100 232 241

RBI ACH-X (8 items)

True: 18 61 131 136 137 186 187

False: 11

RBI NGR-X (10 items)

True: 39 198

False: 47 48 52 115 116 123 182 234

RBI MC-X (9 items)

True: 18 28 36 59 131 164 187

False: 23 115

RBI ESY-X (9 items)

True: 2 115 137 138 168 169 170 228

False: 26

Adjective Check List (ACL)

ACL SAT-X (8 items)

True: 9 10 63 188 219 276

False: 73 278

ACL ACH-X (8 items)

True: 166 177 216 239 245 273 274

False: 11

ACL NGR-X (14 items)

True: 32 99 272 278

False: 2 9 22 69 114 135 210 228 239 288

Edwards Personal Preference Schedule (EPPS)

EPPS SAT-X (7 items)

True: 44 46 116 176 204

False: 207 216

EPPS ACH-X (10 items)

True: 14 22 71 77 81 91 141 147 174

False: 57

EPPS NGR-X (7 items)

True: 53 106 118

False: 7 61 62 127

Appendix B

Psychology 204: Course Evaluation Questionnaire

FOR RESEARCH PURPOSES ONLY

Note. This questionnaire is designed to elicit attitudes towards the experimental teaching procedures utilized in Psychology 204. It is necessary that you identify yourself on the accompanying answer sheet only so that scores from the personality inventories can be related to these measures of satisfaction with the course. These answer sheets will be sealed in envelopes, by section, and will remain unopened until after all course grades have been sent to the Registrar. Therefore, we urge you to be as candid and honest as possible, since your responses to this questionnaire can in no way affect your grade.

Directions

For use with Digitek answer sheet DC 1248.

Follow the directions on the answer sheet for your name and student body identification number. Use a No. 2 pencil, and fill in the blanks completely. Please answer all questions as thoughtfully and as honestly as you can.

Part I (Questions 1 - 5): General Information

1. My major reason for enrolling in Psychology 204 was: [Blacken one box (1) or (2)]

   (1) Primarily to fulfill a college requirement
   (2) Primarily to gain knowledge of the contents of the course

2. What grade do you expect to achieve in Psychology 204? Blacken the one box which corresponds most closely to the grade you expect in this course.

   (0) F
   (1) D
   (2) C-
   (3) C
   (4) C+
   (5) B-
   (6) B
   (7) B+
   (8) A-
   (9) A

3. Do you intend to take any more courses in Psychology? Blacken the one box which corresponds most closely to your present intentions.

   (0) I am completely undecided. I just have no idea at this time how many more Psychology courses I will take.
   (1) I do not intend to take any more Psychology courses.
   (2) I intend to take one or two other Psychology courses, but I do not intend to major in Psychology.
   (3) I intend to take three or four other Psychology courses, but I do not intend to major in Psychology.
   (4) I intend to major in Psychology, although I do not intend to go on to graduate school in Psychology.
   (5) I intend to major in Psychology and then to go on to graduate school in Psychology.

4. How many Scientific American reprints--of those assigned as supplementary reading in Psychology 204--have you read up to this time? Include only the number you have already read, regardless of whether you intend to read some more before the Final Examination. I have read (blacken one box):

   (0) None
   (1) One or two
   (2) Three or four
   (3) Five or six
   (4) Seven or eight
   (5) Nine or ten
   (6) Eleven or twelve
   (7) Thirteen or fourteen
   (8) Fifteen or sixteen
   (9) Seventeen or more

5. How many Psychology 204 lectures have you attended this Quarter? Please answer this question even if you were in a Self-Study class. I have attended approximately (blacken one box):

   (1) None, or one lecture
   (2) Two or three lectures
   (3) Four or five lectures
   (4) Six to eight lectures
   (5) Nine to eleven lectures
   (6) Twelve to fourteen lectures
   (7) Fifteen to seventeen lectures
   (8) Eighteen or nineteen lectures
   (9) All twenty of the lectures

Part II (Questions 6 - 10): General Evaluation of the Course as a Whole

6. How satisfied are you at the present time with this course? [Blacken one box, (1) to (9)]. I am:

(1) Extremely satisfied
(2) Very satisfied
(3) Quite satisfied
(4) Slightly satisfied
(5) Neutral
(6) Slightly dissatisfied
(7) Quite dissatisfied
(8) Very dissatisfied
(9) Extremely dissatisfied

7. What is your reaction to the manner in which Psychology 204 was taught? [Blacken one box, (1) to (7)]

(1) Very disappointed
(2) Quite disappointed
(3) Somewhat unfavorable
(4) Neutral
(5) Somewhat favorable
(6) Quite delighted
(7) Very delighted

8. How does the probable long-range value for you of Psychology 204 compare with all other courses you have had in college? It compares with [Blacken one box, (1) to (5)]

(1) Lowest 10% of other courses
(2) Somewhat below average 20%
(3) Middle 40% of other courses
(4) Somewhat above average 20%
(5) Highest 10% of other courses

9. How did the quality of the teaching in Psychology 204 compare with all other courses you have had in college? It compares with [blacken one box, (1) to (5)]

(1) Lowest 10% of other courses
(2) Somewhat below average 20%
(3) Middle 40% of other courses
(4) Somewhat above average 20%
(5) Highest 10% of other courses

10. How did the average difficulty level of Psychology 204 compare with that of all other courses you have had in college? It compares with [blacken one box, (1) to (5)]

(1) Easiest 10% of other courses
(2) Somewhat below average 20%
(3) Middle 40% of other courses
(4) Somewhat above average 20%
(5) Most difficult 10% of other courses

Part III (Questions 11 - 14): Evaluation of the Personality Inventories

11. How valuable to you was the process of taking the personality inventories? [Blacken one box, (0) to (9)]

(0) I didn't take them
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

12. How interesting to you was the process of taking the personality inventories? [Blacken one box, (0) to (9)].

(0) I didn't take them
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

13. Were there too many personality inventories? Or, not enough? [Blacken one box, (1) to (6)]

(1) I would be willing to take many more inventories
(2) I would be willing to take one or two more inventories
(3) The number of inventories already administered was just right
(4) There were a few too many inventories administered
(5) There were quite a few too many inventories administered
(6) There were far too many inventories administered

14. How honestly did you fill out the inventories? [Blacken one box, (1) to (4)]

(1) I filled out each inventory as candidly as I could
(2) I filled out most of the inventories honestly, but a few a bit less so.
(3) I goofed around on some of the inventories
(4) I goofed around on almost all of the inventories

Part IV (Questions 15 - 17): Evaluation of the Section Meetings

15. How valuable to you were your Section meetings, over-all? [Blacken one box, (0) to (9)]

(0) I didn't attend them
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

16. How interesting to you were your Section meetings, over-all? [Blacken one box, (0) to (9)]

(0) I didn't attend them
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

17. Did your Section Instructor (Mr. Barnett, Mr. Jones, Mrs. Ruiz, or Mrs. Skaife) aid you in understanding the course? How would you rate your Instructor, over-all? [Blacken one box, (1) to (9)]

(1) Excellent
(2) Very good
(3) Quite good
(4) Fairly good
(5) Unsure
(6) Fairly poor
(7) Quite poor
(8) Very poor
(9) Extremely poor

Part V: (Questions 18 - 25): Evaluation of the Textbooks

18. How valuable to you was your first textbook? [Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Brenner: An Elementary Textbook of Psycholanalysis	Eysenck: Uses and Abuses of Psychology

(0) I haven't read it
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

19. How interesting to you was your first textbook? [Blacken one box, (0) to (9)]

(0) I haven't read it
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

20. How valuable to you was your second textbook? [Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Thompson. Psychoanalysis: Evolution and Development	Tyler. Tests and Measurements

(0) I haven't read it
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

21. How interesting to you was your second textbook? [Blacken one box, (0) to (9)]

(0) I haven't read it
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

22. How valuable to you was your third textbook? [Blacken one box (0) to (9)]

Personality	Individual Differences and Developmental
Lazarus. Personality and Adjustment	Mussen. The Psychological Development of the Child

(0) I haven't read it
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

23. How interesting to you was your third textbook? [Blacken one box, (0) to (9)]

(0) I haven't read it
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

24. How valuable to you was your last textbook? [Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Moustakas. Loneliness	Carroll. Language and Thought

(0) I haven't read it
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

25. How interesting to you was your last textbook? [Blacken one box, (0) to (9)]

(0) I haven't read it
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

Part VI (Questions 26 - 31): Evaluation of the Lectures

26. How valuable to you were the lectures, over-all?

(0) I was in a Self-Study Class
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

27. How interesting to you were the lectures, over-all? [Blacken one box, (0) to (9)]

(0) I was in a Self-Study Class
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

28. How valuable to you were the lectures from your first lecturer? [Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Dr. Davison	Dr. Goldberg

(0) I was in a Self-Study Class
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

29. How interesting to you were the lectures from your first lecturer? [Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Dr. Davison	Dr. Goldberg

(0) I was in a Self-Study Class
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

How valuable to you were the lectures from your second lecturer?
[Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Dr. Sermat	Dr. Bricker

(0) I was in a Self-Study Class
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

How interesting to you were the lectures from your second lecturer?
[Blacken one box, (0) to (9)]

Personality	Individual Differences and Developmental
Dr. Sermat	Dr. Bricker

(0) I was in a Self-Study Class
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

VII (Questions 32 and 33): Evaluation of Self-Study

How valuable to you was the Self-Study process? [Blacken one box, (0) to (9)]

(0) I was in a Lecture class
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

33. How did you spend your time during the two hours a week when you would normally have attended lectures? [Blacken one box, (0) to (7)]

(0) I was in a Lecture class
(1) I goofed around during the hours, or otherwise wasted the time
(2) Occasionally,I discussed course material during these hours
(3) Occasionally, I studied during these hours.
(4) Frequently, I discussed course material during these hours
(5) Frequently, I studied during these hours.
(6) Almost always, I discussed course material during these hours
(7) Almost always, I studied during these hours

Part VIII (Questions 34 - 36): Evaluation of the Quizzes

34. How valuable to you were the four quizzes?

(0) I was in a Paper Section
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

35. How interesting to you were the four quizzes? [Blacken one box, (0) to (9)]

(0) I was in a Paper Section
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

36. Would you have preferred more quizzes? Or fewer? [Blacken one box, (0) to (5)]

(0) I was in a Paper Section
(1) I would have preferred weekly quizzes (e.g., 9 or 10 during the Quarter)
(2) I would have preferred a few more quizzes than we had (5-8)
(3) The number of quizzes (4) was just right
(4) I would have preferred a few less quizzes (1-3)
(5) I would have preferred to have no quizzes

Part IX (Questions 37 - 39): Evaluation of the Papers

37. How valuable to you were the four papers? [Blacken one box, (0) to (9)]

(0) I was in a Quiz Section
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

38. How interesting to you were the four papers? [Blacken one box, (0) to (9)]

(0) I was in a Quiz Section
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

39. Would you have preferred more papers? Or fewer? [Blacken one box, (0) to (5)]

(0) I was in a Quiz Section
(1) I would have preferred weekly papers (e.g., 9 or 10 during the Quarter)
(2) I would have preferred a few more papers than we had (5-8)
(3) The number of papers (4) was just right
(4) I would have preferred a few less papers (1-3)
(5) I would have preferred to have no papers

Part X (Questions 40 and 41): Evaluation of the Scientific American Reprints

40. How valuable to you were the Scientific American reprints? [Blacken one box, (0) to (9)]

(0) I did not read enough of them to be able to evaluate them
(1) Extremely valuable
(2) Very valuable
(3) Quite valuable
(4) Fairly valuable
(5) Unsure
(6) Fairly worthless
(7) Quite worthless
(8) A very poor use of my time
(9) A complete waste of my time

41. How interesting to you were the Scientific American reprints? [Blacken one box, (0) to (9)]

(0) I did not read enough of them to be able to evaluate them
(1) Extremely interesting
(2) Very interesting
(3) Quite interesting
(4) Fairly interesting
(5) Neutral
(6) Fairly dull
(7) Quite dull
(8) Very dull
(9) Extremely dull

Part XI (Question 42): Present Preference

42. If you were enrolling in Psychology 204 at the present time, which Course and type of Section would you now prefer? [Blacken one box, (1) to (8)]

Personality	Lectures - Quizzes	(1)
Personality	Lectures - Papers	(2)
Personality	Self-Study - Quizzes	(3)
Personality	Self-Study - Papers	(4)
Indiv. Diff. & Devel.	Lectures - Quizzes	(5)
Indiv. Diff. & Devel.	Lectures - Papers	(6)
Indiv. Diff. & Devel.	Self-Study - Quizzes	(7)
Indiv. Diff. & Devel.	Self-Study - Papers	(8)

Appendix C

INVENTORY OF REPORTED BEHAVIOR

R. Rust

For use with University of Oregon Matrix-1920-Positions Answer Sheet.

Use a No. 2 Pencil; do not use a pen. Follow the directions on the answer sheet for your name and identification. I. Name: Fill in the boxes with the letters in your name. Then starting at the left, blacken the correct space in the column provided below the boxes. Don't skip spaces. If your name is too long for the number of spaces, simply fill in as many letters as you can, (e.g., William James Chesterfield would print CHESTERF W J). II. Class: Freshman, Sophomore, Junior, Senior, Graduate. III. Sex: M=Male, F=Female. IV. Section: Fill in your Section Code Number (01-18). V. Identification Number: Fill in the 8 numbers of your student body card.

DIRECTIONS

This inventory contains statements describing behaviors which some individuals have carried out. Which of these have you ever experienced? On the separate answer sheet, respond [T], for "True," or [F], for "False," depending on whether you have had the experience [T] or have not [F]. Try to be as accurate as possible, and report as "True" only those experiences you have actually carried out, not simply those you may wish you had carried out. Use a No. 2 Pencil and be sure that the number on the answer sheet corresponds with the statement to which you are responding. Answer all items.

HAVE YOU EVER

1. donated blood
2. given money to charity
3. given money to a beggar
4. solicited funds for an organization
5. been inside a country or yacht club
6. attended a rally for a political party or candidate.
7. contributed money to a political party or candidate
8. worked for the election of a political candidate
9. been to a foreign country
10. been outside Oregon
11. driven a car
12. been in an automobile accident
13. been arrested for a traffic violation
14. been arrested for something other than a traffic violation
15. been to a wedding
16. been an usher or a bridesmaid
17. been to a funeral
18. loaned clothing to a friend
19. borrowed clothing from a friend
20. taught Sunday school or other religious school

21. invited friends to a party
22. attended a party given by friends
23. taken a trip in an airplane
24. taken a trip on an ocean liner
25. taken a trip on a bus
26. taken a trip on a train
27. visited a friend's home overnight
28. had a friend visit your home overnight
29. given a present to a male friend
30. given a present to a female friend
31. received a present from a male friend
32. received a present from a female friend
33. prayed (other than during religeous services)
34. kept a diary
35. loaned money
36. borrowed money
37. had a date
38. gone dancing
39. had a date for the movies
40. had a dinner date
41. had a theater date
42. gone on a blind date
43. arranged a blind date for someone else
44. gone on a double-date
45. stayed up all night having fun
46. stolen someone's date
47. had your date stolen by someone else
48. purposely "ditched" a date
49. been "stood up" by a date
50. gone steady
51. been in love
52. proposed marriage to anyone
53. received a marriage proposal
54. gotten engaged or pinned
55. gotten married
56. smoked a cigarette
57. smoked a pack or more of cigarettes in a day
58. smoked a cigar
59. smoked a pipe
60. sworn off smoking
61. visited a male friend at another school
62. visited a female friend at another school
63. drunk coffee
64. drunk tea
65. drunk more than a quart of milk in one day
66. drunk champagne
67. drunk wine
68. drunk beer
69. drunk hard liquor
70. gone out drinking with a group
71. gotten drunk
72. gotten drunk when alone
73. gotten drunk on a date
74. had a hangover
75. had a drink before breakfast or instead of breakfast

76. vomited from drinking
77. passed out from drinking
78. passed out on a date
79. had a date pass out
80. gone on the wagon (sworn off alcoholic beverages)
81. attended a professional baseball game
82. attended a professional football game
83. attended a professional basketball game
84. attended a professional hockey game
85. attended a professional boxing or wrestling match
86. attended a concert or recital
87. attended a professional stage play
88. attended the ballet
89. attended the opera
90. visited an art gallery or museum
91. spent an evening listening to classical music
92. spent an evening watching TV
93. gone to two or more movies in the same week
94. gone to the movies alone
95. attended the circus
96. attended an auto race
97. attended church or synagogue services
98. attended a dance
99. had dancing lessons
100. had music lessons
101. had athletic lessons (tennis, golf, etc.)
102. played bridge
103. played chess
104. played poker
105. shot dice
106. bet on horse races
107. played a slot machine
108. gambled for money
109. stolen anything
110. attended a summer boarding camp
111. played tennis
112. played squash
113. played golf
114. hiked
115. swam
116. dived
117. ice-skated
118. skied
119. boxed
120. wrestled
121. gone fishing
122. camped out overnight
123. gone hunting
124. been in a sailboat
125. played on an organized athletic team
126. won a letter or numerals for athletic ability
127. belonged to a fraternity or sorority
128. been an officer of an organized group
129. acted in a play
130. helped in the production of a play other than acting in it

131. worked on a newspaper or other publication
132. participated in a religious group
133. given a formal talk to a group
134. sung informally with others
135. sung with an organized group
136. played a musical instrument
137. started a conversation with strangers
138. been on radio or TV
139. returned an article to a store
140. made a complaint about food or service in a restaurant
141. interviewed anyone
142. earned money on a part-time job
143. earned money on a full-time job
144. earned money baby-sitting
145. earned money as a salesperson
146. earned money as a camp counselor
147. earned money waiting on tables
148. been fired from a job
149. had a savings account
150. had a checking account
151. had a charge account
152. owned life insurance
153. owned stocks or bonds
154. owned a car
155. owned a bicycle
156. owned a record-player
157. owned formal evening clothes
158. owned a typewriter
159. owned a dictionary
160. owned a Bible
161. belonged to a book club (Book of the Month Club, etc.)
162. subscribed to a news magazine (Time, Newsweek, etc.)
163. done a crossword puzzle
164. written a "letter to the editor"
165. signed a petition
166. been threatened with legal action for non-payment of bills
167. purchased pornographic literature
168. browsed in a book store
169. read a book review
170. tutored anyone
171. been tutored by anyone
172. attended a school dramatic production
173. been an officer of some school organization
174. had a date for a big school weekend
175. had a date for a school football game
176. subscribed to any school publication
177. subscribed to a school newspaper
178. bought or ordered a classbook or yearbook
179. had anything published
180. attended a school "pep rally"
181. "worked out" in the gym on your own initiative
182. attended an outside lecture (not a class lecture)
183. done extra reading for a course on your own initiative
184. read a novel that was not required reading
185. read a non-fiction work that was not required reading

186. read poetry that was not required reading
187. written any poetry on your own initiative
188. stayed up all night studying or writing a paper
189. handed a paper in late
190. dropped a course
191. attended summer school because of low course grades
192. had to repeat a course because of low grades
193. received formal recognition for high grades (name on Honor Roll, etc.)
194. been placed on probation
195. been suspended or expelled
196. cribbed a paper or had someone ghostwrite it for you
197. cheated on a quiz or exam
198. cut classes for two or more consecutive days
199. failed a quiz
200. failed an hour test
201. failed a final exam in a course
202. failed a course
203. received an incomplete for a course grade
204. missed a class because of oversleeping
205. spoken in class without being called on
206. audited a course (attended a course you were not taking for credit)
207. changed your major
208. been in the school library
209. withdrawn a book from the school library
210. studied in the school library
211. taken a difficult course which interested you but was certain to bring down your average
212. given a formal report in class
213. written a paper or report of ten or more pages
214. written a paper or report of thirty or more pages
215. eaten with a faculty member
216. contradicted a faculty member
217. complained about a grade to a faculty member
218. asked a faculty member for advice on improving your grades
219. talked to a faculty member after class about the ideas presented in the day's lecture or discussion
220. belonged to a hobby organization
221. taken vitamin or mineral pills, drops, etc.
222. taken aspirin or a similar compound
223. taken coughdrops or cough syrup
224. taken sleeping tablets
225. taken stimulants (NoDoze, caffein pills, etc.)
226. taken a laxative
227. taken anti-acids (Bromo-Seltzer, etc.)
228. been on a diet to lose weight
229. been on a diet to gain weight
230. gotten up before 6: a.m.
231. lain awake an hour or more before falling asleep
232. had a nightmare
233. had a cold
234. had hay fever or asthma

235. been hospitalized
236. had a physical examination
237. had an operation
238. broken any bones
239. used crutches
240. worn glasses
241. had your teeth cleaned
242. had a cavity filled
243. had a tooth extracted
244. gone without breakfast
245. gone without lunch
246. gone without dinner
247. used a thermometer to take your temperature
248. fainted, passed out, or lost consciousness
249. consulted the school health service on your own initiative
250. missed more than a week's classes because of illness

Appendix D

For use with separate answer sheet.

OREGON INSTRUCTIONAL PREFERENCE INVENTORY

Lewis R. Goldberg

Follow the directions on the answer sheet for your name and identification. I. Name: Fill in the boxes with the letters in your name. Then starting at the left, blacken the correct space in the column provided below the boxes. Do not skip spaces. If your name is too long for the number of spaces, simply fill in as many letters as you can. (e.g., William James Chesterfield would print CHESTERFIELD WILLIAJ). II. Grade: (3)=Freshman, (4)=Sophomore, (5)=Junior, (6)= Senior, (7)=Graduate. III. Birthdate: Mo. (fill in the blank below the month) Year (44,45,46,47, etc.). IV. Sex: (B)=Boy, (G)=Girl. V. Student Number: Starting at the left, fill in the 8 numbers of your student body card number.

DIRECTIONS

Students differ in their preferences for various forms of instruction. For example, some students prefer listening to a lecture rather than reading the same material, while others would prefer reading. Some enjoy laboratory work while others dislike it. Some like weekly quizzes to "keep on one's toes," while others prefer to study at "one's own pace." Which do you prefer? For each question, fill in blank A on the answer sheet if your preference is Alternative A, or blank B if you prefer Alternative B. Do not fill in blanks C,D, or E. The blanks are arranged horizontally in four sections; be sure that the number on the answer sheet corresponds with the question you are answering. It is important that you use a No. 2 pencil and that you fill in the blanks completely.

	Alternative A		Alternative B	
1. A	Studying early in the morning	vs	studying late at night	B
2. A	A formal class	vs	an informal class	B
3. A	A laboratory course	vs	a non-laboratory course	B
4. A	Studying alone	vs	studying with others	B
5. A	A multiple-choice question	vs	an essay question	B
6. A	An easy course	vs	a hard course	B
7. A	Discussing your ideas	vs	writing down your ideas	B
8. A	Discussion sections	vs	lectures	B
9. A	A course with weekly quizzes	vs	a course with only regular exams	B
10. A	An older professor	vs	a younger professor	B

11.	A	A course with many lecturers	vs	A course with a single lecturer	B
12.	A	A course with more than average reading	vs	a course with less than average reading	B
13.	A	Working on a group project	vs	working on an individual project	B
14.	A	Unannounced tests	vs	regularly scheduled tests	B
15.	A	Televised instruction	vs	face to face lectures	B
16.	A	Studying for examinations	vs	writing term-papers	B
17.	A	A specific list of readings	vs	a general list of topics to study	B
18.	A	An honors section	vs	a regular section	B
19.	A	An early morning class	vs	a late morning class	B
20.	A	A disorganized but interesting lecture	vs	a well organized but duller lecture	B
21.	A	A course requiring no term-paper	vs	a course requiring a term-paper	B
22.	A	Reading a paper	vs	hearing the paper read	B
23.	A	A course demanding originality	vs	a course demanding a good memory	B
24.	A	An easy lecture	vs	a difficult lecture	B
25.	A	Being graded for class participation	vs	being graded on examinations only	B
26.	A	A course with a textbook or two	vs	a course with many books or articles	B
27.	A	A male professor	vs	a female professor	B
28.	A	A poor grade in a stimulating course	vs	a good grade in a dull course	B
29.	A	Highly specific essay questions	vs	quite general essay questions	B
30.	A	An evening class	vs	an early morning class	B
31.	A	A large class		a small class	B
32.	A	A course with a supplementary optional reading list	vs	a course with assigned reading only	B
33.	A	A course where the lectures parallel the textbook	vs	a course where the lectures cover different material than the text	B
34.	A	A course taught by a professor you've had before	vs	a course taught by a professor unknown to you	B

35.	A	A stimulating course at an inconvenient hour	vs	a duller course at a perfect hour	B
36.	A	A professor who presents a survey of many points of view	vs	a professor who presents one unified point of view	B
37.	A	A highly recommended elective course	vs	a course which fulfills a college requirement	B
38.	A	A practical course	vs	a theoretical course	B
39.	A	A course in a dull area taught by a stimulating professor	vs	a course in a stimulating area taught by a dull professor	B
40.	A	A cold, brilliant professor	vs	a warm, average professor	B
41.	A	A morning class	vs	an afternoon class	B
42.	A	A multiple-choice examination	vs	a true-false examination	B
43.	A	Reading	vs	solving problems	B
44.	A	Smoking permitted in class	vs	smoking not permitted in class	B
45.	A	A strict professor	vs	a lenient professor	B
46.	A	All your classes on the same three days	vs	some classes every day	B
47.	A	A course with a pre-determined schedule of topics	vs	a course where student interest determines the topic	B
48.	A	A course where tests are discussed after grading	vs	a course where no class time is devoted to test discussion	B
49.	A	Studying late into the night before a test	vs	going to sleep and studying early in the morning before the test	B
50.	A	A lecturer who discourages student questions	vs	a lecturer who encourages student questions	B
51.	A	A course graded on a curve	vs	a course graded on absolute standards	B
52.	A	Studying in the library	vs	studying in your own room	B
53.	A	Your classes spread evenly throughout the day	vs	all your classes in the morning or all in the afternoon	B
54.	A	A course requiring library research	vs	a course requiring no library research	B
55.	A	Being graded on the absolute amount of one's knowledge of course content	vs	being graded on amount of improvement in one's knowledge of course content	B

56. A A "pass or fail" grading system vs an A,B,C,D,F grading system B

57. A A lecturer who outlines his lectures vs a lecturer who does not outline his lectures B

58. A A "take-home" examinations vs an "in-class" examination B

59. A A course in which daily assignments are made vs a course in which you pace yourself B

60. A Classes which meet more often for a shorter class period vs classes which meet less often for a longer class period B

61. A Examinations taken under the "honor system" vs proctored examinations B

62. A Taking a few courses, each of many credits vs taking many courses, each of few credits B

63. A Examinations scheduled early in the week vs examinations scheduled late in the week B

64. A One course lasting three quarters vs a different course for each quarter B

65. A A professor who grades strictly but is stimulating vs a professor who grades leniently but is not stimulating B

66. A A course which increases in difficulty as the term goes on vs a course which remains at the same level of difficulty B

67. A A course with only a final exam no mid-term examination vs a course with a mid-term and a final B

68. A Study dates vs studying alone B

69, A Studying in spurts vs studying regularly all quarter B

70. A Studying to music vs Studying in complete silence B

71. A A course to extend your knowledge in a field you know vs a course to introduce you to a new field B

72. A A specialized or professional education vs a liberal education B

73. A A front-row seat in class vs a back-row seat in class B

74. A An idealistic professor vs a practical professor B

75. A A professor who calls students by their first names vs a professor who addresses students more formally B

76. A A class with many of your friends in it vs a class with none of your friends in it B

77. A A professor whose primary concern is teaching vs a professor who is extensively engaged in research B

78. A	A course with dull reading but stimulating lectures	vs	a course with stimulating reading but dull lectures	B
79. A	A general survey course	vs	a more specialized course	B
80. A	Standardized examinations	vs	examinations constructed by each instructor	B
81. A	Optional discussion sections	vs	required discussion sections	B
82. A	A coeducational class	vs	a segregated (single sex) class	B
83. A	A course with frequent quizzes	vs	a course requiring frequent papers	B
84. A	A "traditional" lecture course	vs	a "self-study" (no-lecture) course	B

Appendix E

ACCURACY of SELF-INSIGHT SCALE

L.R. Goldberg

For use with Digitek DC 1248 Answer Sheet.

Follow the directions on the answer sheet for your name and identification. Use a No. 2 Pencil, and fill in the blanks completely.

DIRECTIONS

Imagine yourself in the shoes of other individuals who have to interact with you as a peer (i.e., friends and acquaintances, on and off campus). How do they view you? How accurately can you estimate the way you are perceived by others?

Estimate, as accurately as possible, how others would rate you on each of the following traits. If you think everyone would rate you extremely high on the trait, blacken the box numbered /9/ on the accompanying answer sheet. If you think that everyone would rate you extremely low on the trait, blacken the box numbered /0/. If you think that most people would rate you about average on the trait -- or if you think that half of your friends and acquaintances would rate you high and the other half would rate you low -- blacken either box /4/ or box /5/, depending on whether you think, in general, you'd be rated very slightly below average /(4)/ or very slightly above average /(5)/. Use the intermediate numbers for intermediate ratings. Be sure to rate all 18 traits. Rate yourself as you think others would rate you, not necessarily as you know yourself to be or as you might wish to be. A high score on this inventory comes through estimating as accurately as possible the reactions of others to you.

Make sure that the number of the trait you are rating corresponds to the item number (1 - 18) on the accompanying answer sheet.

1. Dominance

   Highs /9/ tend to be seen as: Aggressive, confident, persistent, and planful; as being persuasive and verbally fluent; as self-reliant and independent; and as having leadership potential and initiative.

   Lows /0/ tend to be seen as: Retiring, inhibited, commonplace, indifferent, silent and unassuming; as being slow in thought and action; as avoiding situations of tension and decision; and as lacking in self-confidence.

2. Capacity for Status

   Highs /9/ tend to be seen as: Ambitious, active, forceful, insightful, resourceful, and versatile; as being ascendant and self-seeking; effective in communication; and as having personal scope and breadth of interests.

   Lows /0/ tend to be seen as: Apathetic, shy, conventional, dull, mild, simple, and slow; as being stereotyped in thinking; restricted in outlook and interests; and as being uneasy and awkward in new or unfamiliar social situations.

3. Sociability

Highs /9/ tend to be seen as: Outgoing, enterprising, and ingenious; as being competitive and forward; and as original and fluent in thought.

Lows /0/ tend to be seen as: Awkward, conventional, quiet, submissive, and unassuming; as being detached and passive in attitude; and as being suggestible and overly influenced by other's reactions and opinions.

4. Social Presence (poise, spontaneity, and self-confidence in social interaction)

Highs /9/ tend to be seen as: Clever, enthusiastic, imaginative, quick, informal, spontaneous, and talkative; as being active and vigorous; and as having an expressive and ebullient nature.

Lows /0/ tend to be seen as: Deliberate, moderate, patient, self-restrained, and simple; as vacillating and uncertain in decision; and as being literal and unoriginal in thinking and judging.

5. Self-acceptance

Highs /9/ tend to be seen as: Intelligent, outspoken, sharp-witted, demanding, aggressive, and self-centered; as being persuasive and verbally fluent; and as possessing self-confidence and self-assurance.

Lows /0/ tend to be seen as: Methodical, conservative, dependable, conventional, easygoing, and quiet; as self-abasing and given to feelings of guilt and self-blame; and as being passive in action and narrow in interests.

6. Sense of Well-being (minimizing worries and complaints; freedom from self-doubt and disillusionment)

Highs /9/ tend to be seen as: Energetic, enterprising, alert, ambitious, and versatile; as being productive and active; and as valuing work and effort for its own sake.

Lows /0/ tend to be seen as: Unambitious, leisurely, awkward, cautious, apathetic, and conventional; as being self-defensive and apologetic and as constricted in thought and action.

7. Responsibility

Highs /9/ tend to be seen as: Planful, responsible, thorough, progressive, capable, dignified, and independent; as being conscientious and dependable; resourceful and efficient; and as being alert to ethical and moral issues.

Lows /0/ tend to be seen as: Immature, moody, lazy, awkward, changeable, and disbelieving; as being influenced by personal bias, spite, and dogmatism; and as under-controlled and impulsive in behavior

8. Socialization (social maturity, integrity, and rectitude)

Highs 9 tend to be seen as: Serious, honest, industrious, modest, obliging, sincere, and steady; as being conscientious and responsible; and as being self-denying and conforming.

Lows 0 tend to be seen as: Defensive, demanding, opinionated, resentful, stubborn, headstrong, rebellious, and undependable; as being guileful and deceitful in dealing with others; and as given to excess, exhibition, and ostentation in their behavior.

9. Self-control

Highs 9 tend to be seen as: Calm, patient, practical, slow, self-denying, inhibited, thoughtful, and deliberate; as being strict and thorough in their own work and in their expectations for others; and as being honest and conscientious.

Lows 0 tend to be seen as: Impulsive, shrewd, excitable, irritable, self-centered, and uninhibited; as being agressive and assertive; and as overemphasizing personal pleasure and self-gain.

10. Tolerance

Highs 9 tend to be seen as: Enterprising, informal, quick, tolerant, clear-thinking, and resourceful; as being intellectually able and verbally fluent; and as having broad and varied interests.

Lows 0 tend to be seen as: Suspicious, narrow, aloof, wary and retiring; as being passive and overly judgmental in attitude; and as disbelieving and distrustful in personal and social outlook.

11. Good Impression (capacity to create a favorable impression, and concern about others' reactions)

Highs 9 tend to be seen as: Co-operative, enterprising, outgoing, sociable, warm, and helpful; as being concerned with making a good impression; and as being diligent and persistent.

Lows 0 tend to be seen as: Inhibited, cautious, shrewd, wary, aloof, and resentful; as being cool and distant in their relationships with others; and as being self-centered and too little concerned with the needs and wants of others.

12. Communality ("averageness")

Highs 9 tend to be seen as: Dependable, moderate, tactful, reliable, sincere, patient, steady, and realistic; as being honest and conscientious; and as having common sense and good judgment.

Lows 0 tend to be seen as: Impatient, changeable, complicated, imaginative, disorderly, nervous, restless, and confused; and as being guileful and deceitful; inattentive and forgetful; and as having internal conflicts and problems.

13. Achievement through Conformity

Highs /9/ tend to be seen as: Capable, co-operative, efficient, organized, responsible, stable, and sincere; as being persistent and industrious; and as valuing intellectual activity and intellectual achievement.

Lows /0/ tend to be seen as: Coarse, stubborn, aloof, awkward, insecure, and opinionated; as easily disorganized under stress or pressures to conform; and as pessimistic about their occupational futures.

14. Achievement through Independence

Highs /9/ tend to be seen as: Mature, forceful, strong, dominant, demanding, and foresighted; as being independent and self-reliant; and as having superior intellectual ability and judgment.

Lows /0/ tend to be seen as: Inhibited, anxious, cautious, and dissatisfied, dull, and wary; as being submissive and compliant before authority; and as lacking in self-insight and self-understanding.

15. Intellectual Efficiency (Intelligence)

Highs /9/ tend to be seen as: Efficient, clear-thinking, capable, intelligent, progressive, planful, thorough, and resourceful; as being alert and well-informed; and as placing a high value on intellectual matters.

Lows /0/ tend to be seen as: Cautious, confused, easygoing, defensive, shallow, and unambitious; as being conventional and stereotyped in thinking; and as lacking in self-direction and self-discipline.

16. Psychological-mindedness (Empathy)

Highs /9/ tend to be seen as: Observant, spontaneous, quick, perceptive, talkative, resourceful, and changeable, and as being verbally fluent and socially ascendant.

Lows /0/ tend to be seen as: Apathetic, peaceable, serious, cautious, and unassuming; as being slow and deliberate in tempo; and as being overly conforming and conventional.

17. Flexibility

Highs /9/ tend to be seen as: Flexible, insightful, informal, adventurous, confident, humorous, rebellious, idealistic, assertive, and egoistic, as being sarcastic and cynical; and as highly concerned with personal pleasure and diversion.

Lows /0/ tend to be seen as: Deliberate, cautious, worrying, industrious, guarded, mannerly, methodical, and rigid; as being formal and pedantic in thought; and as being overly deferential to authority custom and tradition.

18. **Femininity**

Highs /9/ tend to be seen as: Feminine, appreciative, patient, helpful, gentle, moderate, persevering, and sincere; as being respectful and accepting of others; and as behaving in a conscientious and sympathetic way.

Lows /0/ tend to be seen as: Outgoing, hard-headed, ambitious, masculine, active, robust, and restless; as being manipulative and opportunistic in dealing with others; blunt and direct in thinking and action; and impatient with delay, indecision, and reflection.